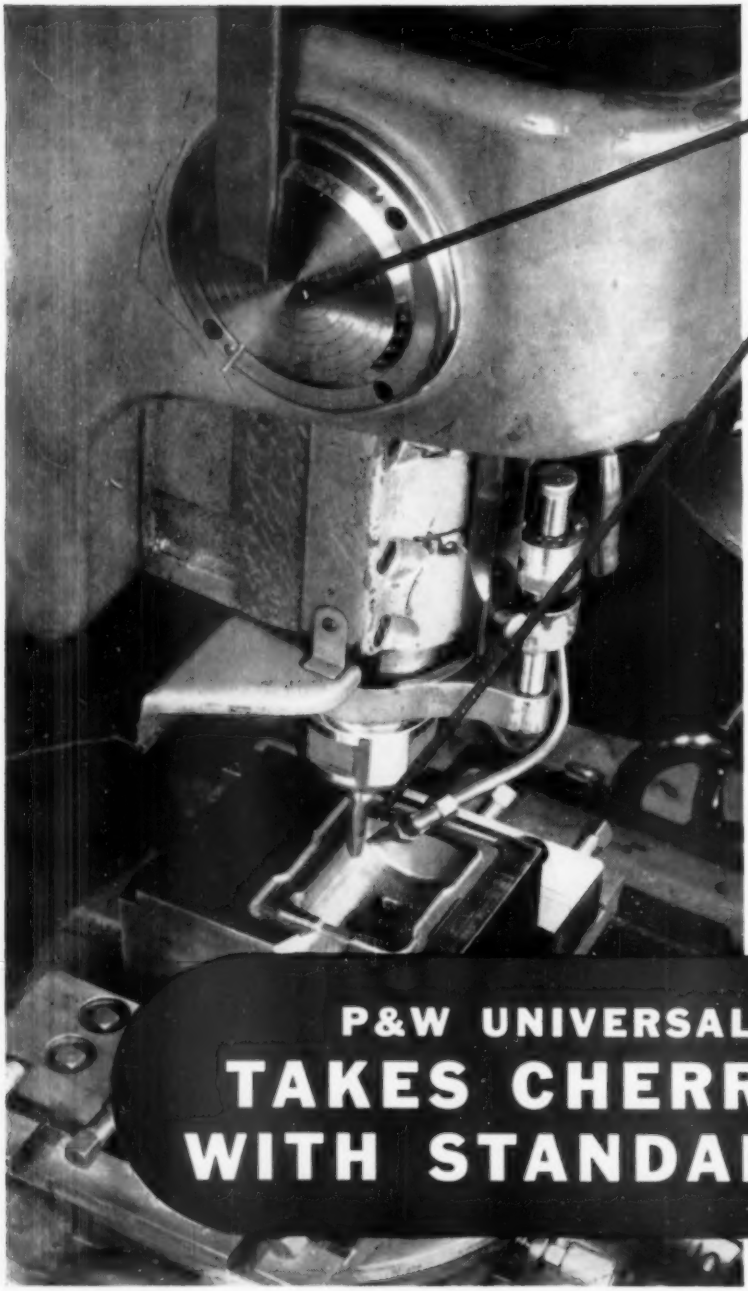
VOL. XX, NO. 5 APRIL, 1948

THE TOOL ENGINEER

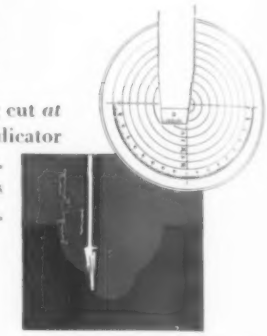
OFFICIAL PUBLICATION OF THE ASTE AMERICAN SOCIETY OF TOOL ENGINEERS

Departments

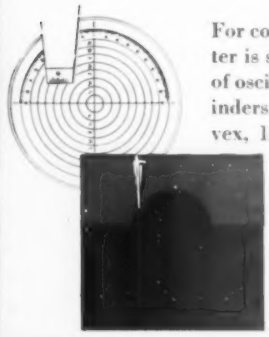
Behind every manufactured product is the tool engineer



Indicator marks position of cutter making finishing cut over cylindrical cavity in tough die steel. Oscillating head makes easy work of many jobs that are either very difficult or impossible with ordinary die sinking equipment. With work held in a rotary vise, this can become a spherical cavity produced with equal ease.



Machine can take cherrying cut *at bottom of any cavity*, indicator again showing radius of cut. With work in rotary vise, this also can be a spherical cavity.



For convex cylinders or spheres, cutter is set to move through upper half of oscillator travel. Straight cuts, cylinders and spheres, concave or convex, 180° or any part of it, on any radius within limits . . . all are part of the day's work. These are the three basic cuts. Combinations of them in whole or in part are endless.

P&W UNIVERSAL DIE SINKER
TAKES CHERRYING CUTS WITH STANDARD CUTTERS

This feature gives you better dies at less cost wherever you put it to work. The P&W Universal Die Sinker's oscillating head, operating through adjustable eccentrics, does the job and eliminates much expensive hand finishing. This powerful modern machine lets you hog out heavy cuts, then finish so accurately that hand work and polishing is a matter of minutes. *And all this with ordinary, low-cost die-sinking cutters.*

Machine shown in the photo is Pratt & Whitney Universal Die Sinker 3B, one of a complete line you may have seen in action at the recent Machine Tool Show. Bulletin, sent on request, covers all models, both Plain and Universal.

PRATT & WHITNEY

Division Niles-Bement-Pond Company

WEST HARTFORD 1, CONNECTICUT

The Tool Engineer

Official Publication: American Society of Tool Engineers

April, 1948

Vol. XX, No. 3

Editorial

They Will See and Believe

CAUGHT IN THE MERCILESS CLUTCHES of postwar poverty, many European lands are falling easy prey to the protagonists of authoritarian ideologies who, as we know, would drive democracy and its fundamental principles of human freedom from the Continent.

Inspired by selfish as well as humanitarian motives, public and private debates have been going on for months as to the best course the United States can take in helping these war-weakened nations toward rehabilitation. Dollars, in number almost beyond comprehension, have taken the leading role in these discussions. Money is tremendously important in that it will give immediate relief; will provide food, shelter and clothes for those who now suffer privation.

Money alone, however, is not the answer to Europe's economic and social problems. It only provides existence. Huge government loans, operated by red tape-entangled agencies, will eventually arouse antagonism both at home and abroad. Essential and effective as an emergency measure, loans are not the basis of a sound, year-in-year-out program. The people of America will come to resent this expenditure of their tax money; to other people of the world, it will smack of economic imperialism.

Far better that, having provided for their immediate needs, we turn our attention to helping the Europeans to help themselves. One of the best ways to do that is to export our productive and engineering know-how; our tools and machines. We should show our economic system in action. This can best be done by American industry and its representatives.

The people of the world will benefit from coming in touch with our system of free enterprise; therefore, any lasting American improvement abroad will have to be made primarily by private enterprise. By taking to the people of the world operating examples of economic freedom, we can best show them that it is an integral part of the kind of life they want to live.

Europeans should be made aware that our mass production system has given the United States a standard of living which, by far, exceeds the best achieved on the Continent. Yet, although that knowledge would doubtless create strong desires to emulate the American system, desire alone has no way of supplying all of the things that they must have to build a comparable economy. Undernourished people are not efficient workers. They can't be! And modern production plants cannot grow overnight from the rubble of demolished factories, nor can skilled labor be recruited in quantity from a population drained of its manpower by years of war.

Even if they could overcome all of these obstacles there would still be the problem of equipping the plants with the tools which are the very heart of the mass production system. And tools are not to be had for the mere wishing. Thus, it is obvious that the things which are most needed to produce a stable economy in Europe are those which the people cannot possibly secure for themselves. They are also the very things which they must have if they are to return to a state of self-sufficiency.

All things considered, then, we can best help the Europeans to help themselves by giving them the experience, skill, knowledge and tools required to produce the goods so vitally needed. If we are able to give them these things, they will carry with them a stronger conviction of the soundness and rightness of our political and cultural ideals than we could ever create by gales of oratory. If we will let them see, they will believe.

I. F. Holland

President 1948-49

THE TOOL ENGINEER is published monthly in the interest of the members of the American Society of Tool Engineers. Entered as second class matter, November 4, 1947, at the post office at Milwaukee, Wisconsin, under the Act of March 3, 1879. Yearly subscription, $2.00. Non-members, $6.00. Canada, $6.50; all other foreign countries, $8.00 per year.

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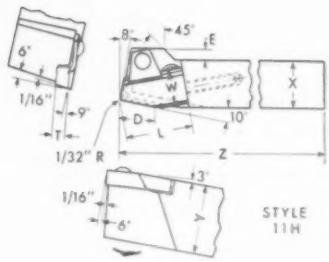
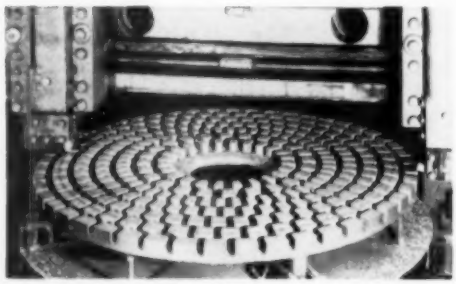
IF Interrupted Cuts Are Your Problem

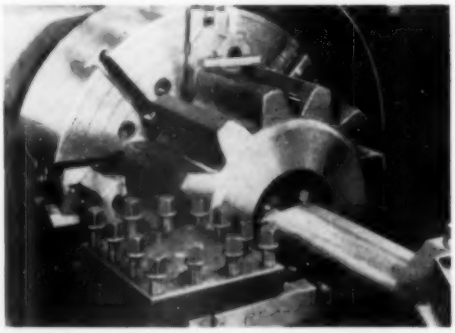
Learn About Kennametal



Style 11H is one of a complete line of Kennametal tools, having sturdy, clamped-in, advanceable Kennametal tips. This assembly—developed by Kennametal—is highly successful on interrupted cutting, and is equally outstanding on continuous-cut operations. It utilizes Kennametal's high strength to best advantage—provides a thermally-strain-free assembly; makes possible deep cuts and heavy feeds; simplifies grinding since tip is advanced and re-sharpened without removing any steel from shank; and enables practically all of the Kennametal tip to be utilized for cutting.



This iron casting has 288 chilled lump interruptions. A Kennametal standard Style 11T80 tool faces and turns it at 190 ft./min., .048" feed, and ¼" depth of cut.



Kennametal bores, turns, and faces over interruptions and sand holes on this chrome-nickel steel rack pinion. Speed—155 ft./min.; feed—.032"; depth of cut—¼" to 5/16". Performance is 5 to 1 over high speed steel tools in production and pieces per grind.

You're probably enjoying the advantages of carbide tooling on continuous-cut operations—but how about interrupted cutting?

Has this given you tool trouble, and made you resort to slower machining methods on some important jobs?

If so, Kennametal will help you solve this problem. Its ability to withstand the shock of interrupted cuts, on both cast iron and steel, has been unequalled.*

Although cutting conditions are often improved by changing the tool shape so that the shock will be imposed on a section of the tip that is stronger and better supported, it is still the carbide that must take the punishment. Here's where Kennametal has a distinct advantage.

Because of exclusive processing methods and careful control in manufacture Kennametal's impact strength is unusually high for such a hard material—as great as that of hardened alloy steels having much lower hardness and compressive strength.

Still further advantages for interrupted cutting are obtained by the use of mechanically-held tools developed by Kennametal Inc. Tips of characteristically high impact strength are securely clamped to, and firmly supported by a heat-treated steel shank, to provide an exceptionally strong strain-free assembly.

If you have had difficulty with carbide tools on interrupted cuts, let us engineer Kennametal to the solution of your particular problem.

** Ask us to send you a set of Performance Reports that demonstrate the superior results obtained with Kennametal Tools on interrupted cutting.*

KENNAMETAL Inc.

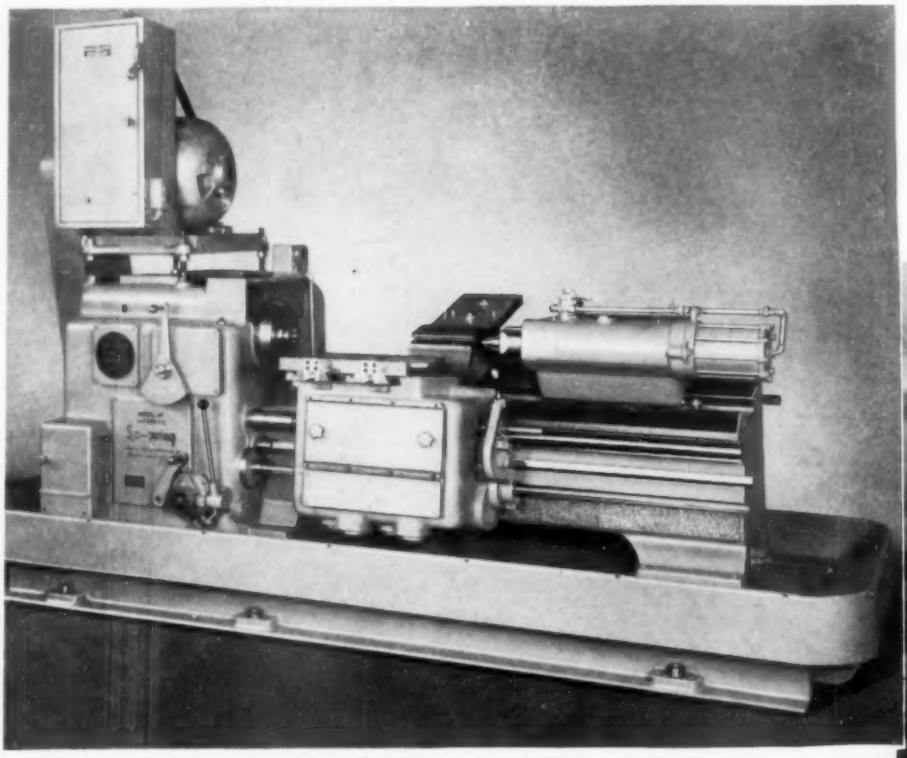
Trade Mark Reg. U.S. Pat. Off.

LATROBE, PA.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTION

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



Front view of machine without tooling.

Close-up view showing tooling.

Lo-swing MODEL AR LATHE EQUIPPED FOR TURNING DIESEL MOTOR PISTONS

Problem: To automatically turn, groove and face special alloy pistons having a maximum diameter of 8".

Solution: The Model AR Lo-swing was selected for this job due to its rigidity and "Simplified Change-over Mechanism" which permits changing over from one size piston to another in a few minutes by simply making a few adjustments in gear segments and cam which controls cross slide and rapid traverse movements.

The work is centered on the driven end with an adapter plate machined to fit the bore of the open end of the piston which has been previously machined. This adapter is fitted with a hardened steel driving plate which contacts a lug cast on the inside piston wall, assuring a positive drive. The piston is supported on the tailstock end with a standard 60° revolving type center.

The turning operation consists of machining the outside diameters with four tools mounted on a single cross slide. The grooving and facing tools are clamped on two independently operated Back Squaring Attachments, the movements of which are synchronized with the front slide.

The end facing tool is mounted in a special relieving type tool block (see close-up view) which automatically relieves the tool on the return stroke, preventing any scoring or marking of the finished face.

Sintered carbide tools are used on this job and a high grade finish is obtained on the ring grooves.

Seneca Falls Engineers are always at your disposal to help find cost cutting solutions for your turning problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH Lo-swing

YOU CAN'T AFFORD NOT TO USE STARRETT PRECISION GROUND FLAT STOCK

How many hours do your men waste hunting up stock or grinding odd pieces to size for special tools and parts? Plug this source of waste with Starrett Precision Ground Flat Stock. Keep a supply of frequently used sizes in the tool crib or buy it as needed through your mill supply distributor. Write for Ground Flat Stock Folder and Chart "E" which gives complete information, lists sizes, hardening instructions, etc.

WATER HARDENING

A high grade tool steel specially made to Starrett specifications. Annealed for easy machining. Develops maximum hardness when quenched in water or brine and may be drawn to any desired temper in oil.

OIL HARDENING

A non-deforming, electric furnace tool steel, fully spherodized annealed with fine grain structure and deep hardening characteristics. Ideal for precision parts which require accuracy of size after hardening.

MADE IN TWO TYPES

18 inch lengths, widths from ½ to 6 inches, thickness from a sixty-fourth to an inch or more. Flat sides precision ground parallel and straight to within .001 inch of size, ends machined square. Each piece individually wrapped and clearly identified.

STARRETT

PRECISION TOOLS
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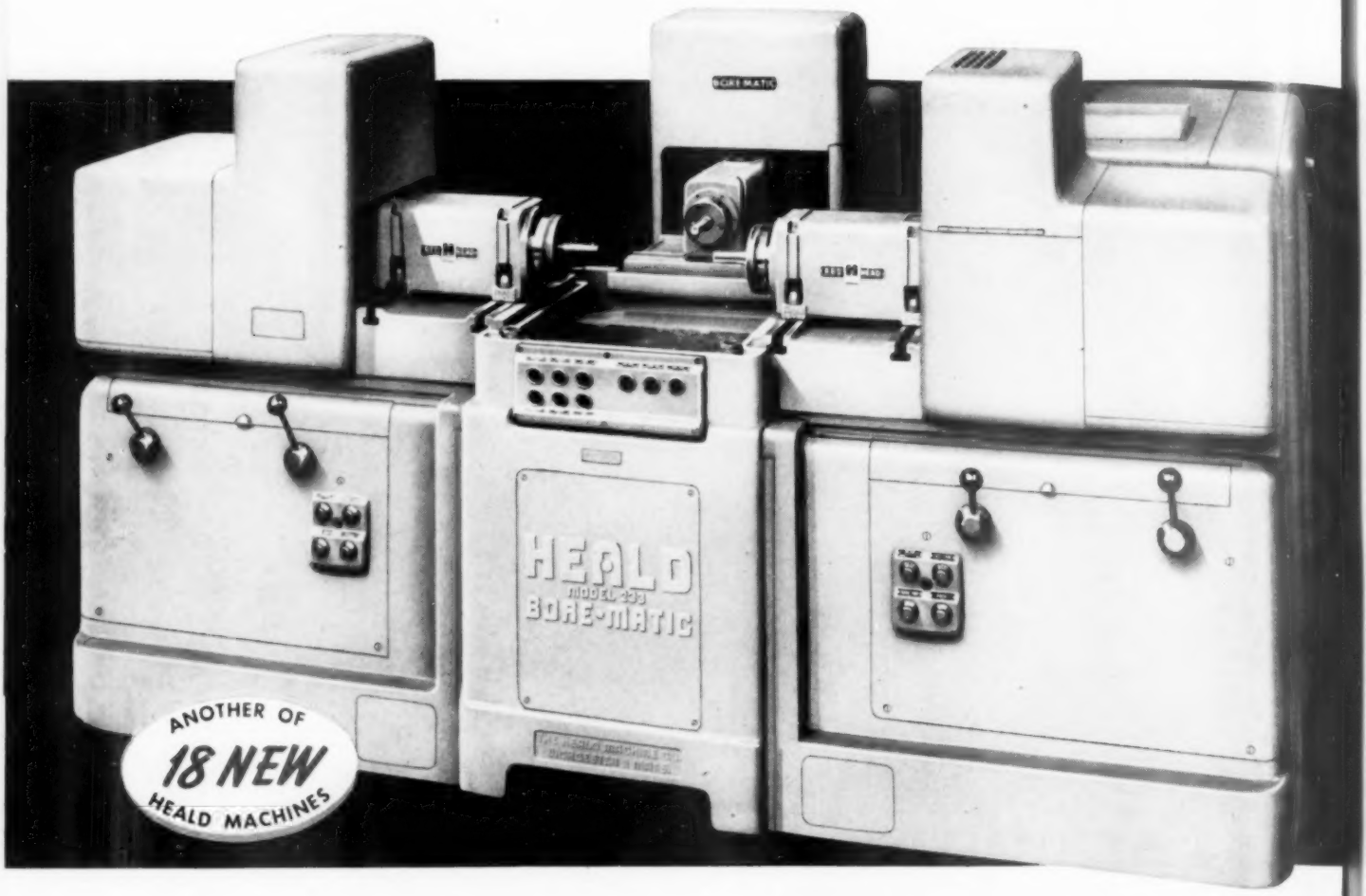
Completely New

HEALD Multi-Way BORE-MATICS



Simultaneously "borize" two or more angularly spaced holes

YOU CAN BORE in two or three directions at the same time. Bore in each direction with one, two or three boringheads, at different rates of "in" and "out" feeds. Besides boring, you can face, turn, chamfer, groove and fly cut, alone or in any combination of these operations. And do *all this* automatically, at the same setting.

Here is modern machining at its most spectacular—in the all-new Heald Multi-Way Bore-Matics, ready to do just about anything in the way of highest-production, highest-precision finishing.

These machines are extremely versatile in application, the center section having workholding fixtures readily adaptable to large cumbersome parts or awkwardly shaped work. Into them has been incorporated a vast fund of Heald engineering research and experience, including such outstanding Heald features as:

SINGLE HYDRAULIC POWER UNIT—furnishes hydraulic power to entire machine . . . assuring smooth, even performance.

TWO-PUMP SYSTEM—single relief valve control circulates only minimum amount of oil . . . isolated from base to reduce heat and vibration, provide easier maintenance.

UNIFORM HYDRAULIC FEEDS—remain constant throughout the day without adjustment . . . maintain definite production, finish and accuracy.

Nearest Heald branch office can give you complete details.

• **WRITE FOR BULLETIN** on these new Heald Multi-Way Bore-Matics. Lists specifications for Models 233-333-232-332.

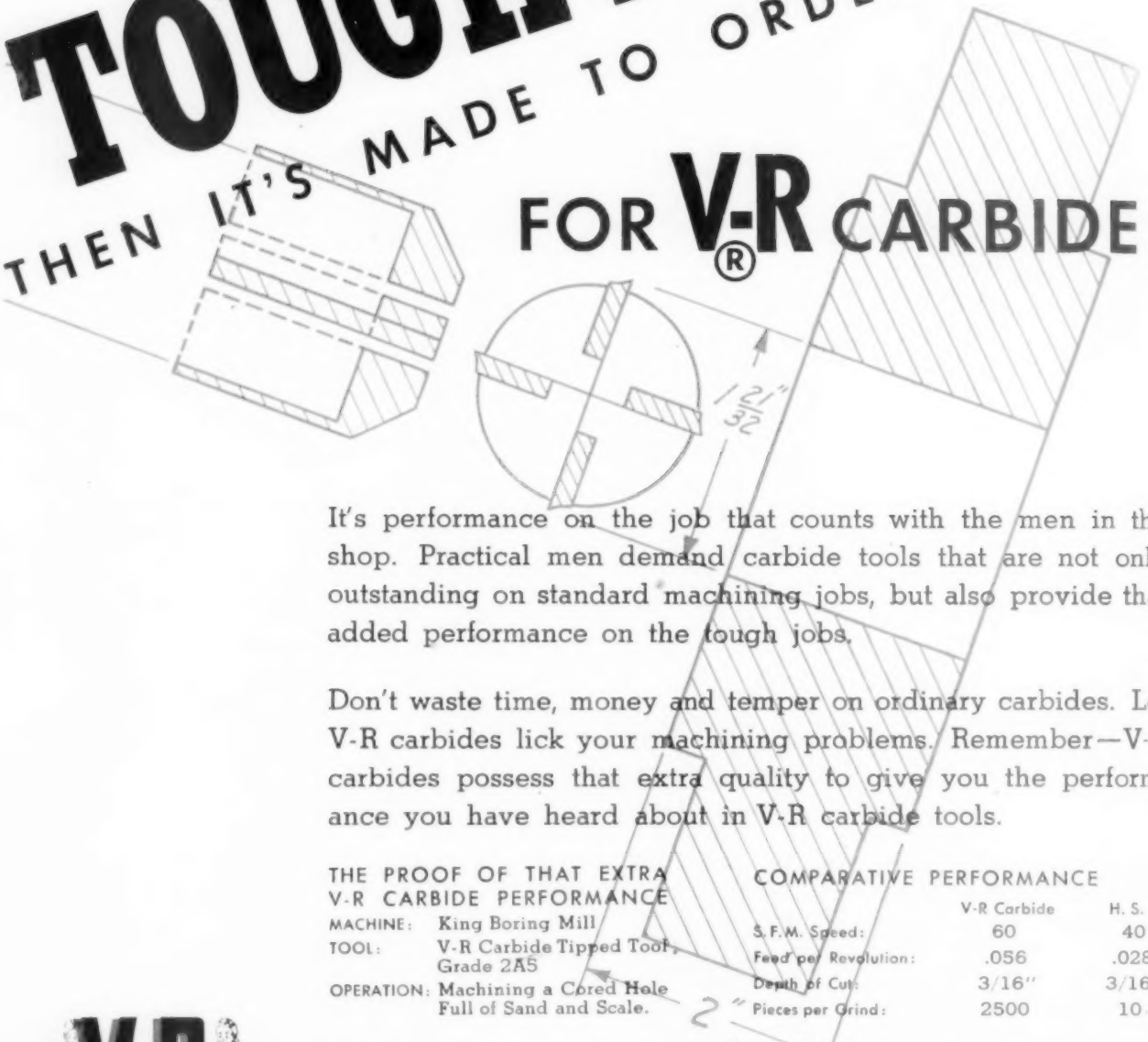
HEALD

THE HEALD MACHINE COMPANY, Worcester 6, Mass.

Branch Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • Lansing • New York

TOUGH?

THEN IT'S MADE TO ORDER FOR V-R® CARBIDE!



It's performance on the job that counts with the men in the shop. Practical men demand carbide tools that are not only outstanding on standard machining jobs, but also provide that added performance on the tough jobs.

Don't waste time, money and temper on ordinary carbides. Let V-R carbides lick your machining problems. Remember—V-R carbides possess that extra quality to give you the performance you have heard about in V-R carbide tools.

THE PROOF OF THAT EXTRA V-R CARBIDE PERFORMANCE

MACHINE: King Boring Mill
TOOL: V-R Carbide Tipped Tool, Grade 2A5
OPERATION: Machining a Cored Hole Full of Sand and Scale.

COMPARATIVE PERFORMANCE

	V-R Carbide	H. S. S.
S.F.M. Speed:	60	40
Feed per Revolution:	.056	.028
Depth of Cut:	3/16"	3/16"
Pieces per Grind:	2500	10

V-R®

REMARKS: 60 SFM is top speed of the machine. Little tip wear apparent at end of run. Another 2500 pieces could be run before grinding would be necessary.

KEEP UP TO DATE ON V-R CARBIDE TOOL GRADES AND THEIR APPLICATION! Write or call your nearest Vascoloy-Ramet Field Engineer for information about V-R carbide's outstanding performance on stainless steel, steel alloys, non-ferrous and non-metallic applications.

SEND for your free copy of the NEW VR-400 Carbide Tool and Blank Catalog. 32-pages of vital carbide engineering information. Address Dept. TC547.

VASCOLOY-RAMET CORPORATION NORTH CHICAGO ILLINOIS
District Sales and Service in Principal Cities
An affiliate of The Fansteel Metallurgical Corporation and The Vanadium Alloys Steel Company

report no. 8

TANTUNG® TRIPLES PRODUCTION

Results speak for themselves. Here is a tripled production achieved when a change was made to Tantung:

FIELD TEST REPORT ON TANTUNG

OPERATION:	Facing
WORK PIECE:	Automobile Generator Pulley
MACHINE:	J & L Turret Lathe
MATERIAL:	Malleable iron casting 3¾" diameter
SPEED, S.F.M.:	Doubled over H.S.S.
FEED:	Doubled over H.S.S.
TOOL:	5/16"x 5/16"x 2½" Tantung tool bit

PERFORMANCE: Production increased from 30 to 90 pieces per day through the use of Tantung. The Tantung had to face over 4 bosses, making a somewhat severe cut.

Results such as this can be achieved in your shop. Try Tantung today on your troublesome and costly production problems. Remember . . . . . Tantung, the tough, shock resistant, non-ferrous cast alloy performs at far greater speeds and feeds on your present equipment than high speed steels. Also ask about Tantung's outstanding wear-resistant applications!

V-R

Call your nearest Vascoloy-Ramet Field Engineer for experienced, courteous help in solving your production problems, or direct your inquiry to the home office.

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Everything from

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Snips

Hollow Punches

Slip Roll Former

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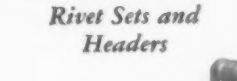
Crimper and Beader



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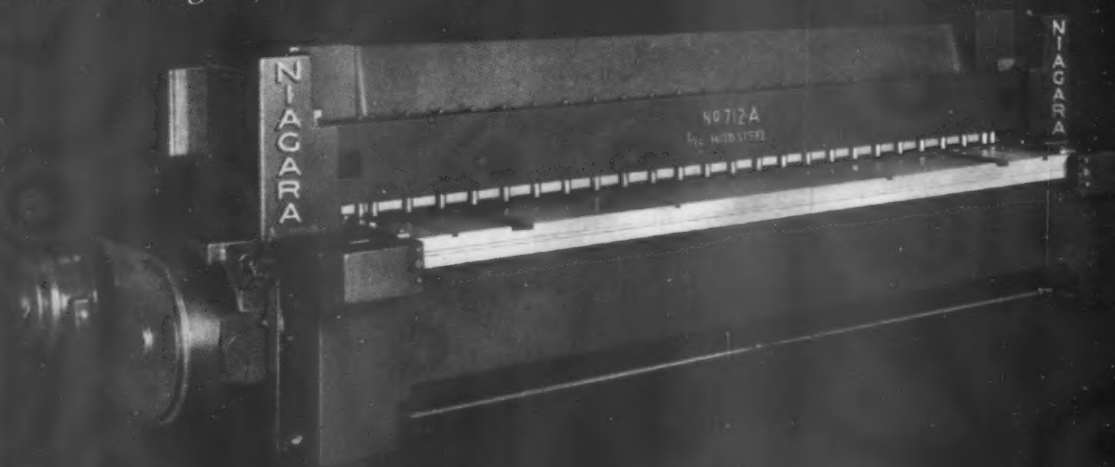
Electric Combination Machine

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, N.Y.

NIAGARA

POWER PRESSES *and* SHEARS

● Niagara offers America's most complete line of tinner's tools, machines, power presses and shears for production and maintenance. Illustrations on these pages show how they range from items as simple as a rivet set up to heavy presses and power squaring shears. Whether you require hand, foot or power operated equipment, — you get the best when you specify Niagara. Write for catalogs.



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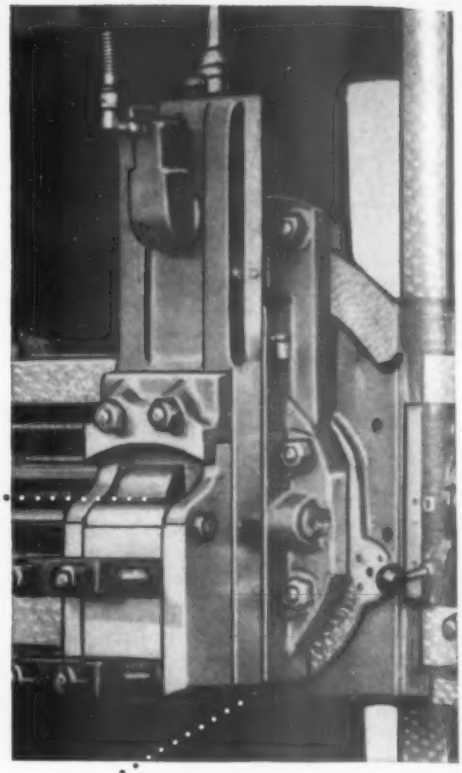
Both in the Hypro rail head

. . . these exclusive Hypro dependable features

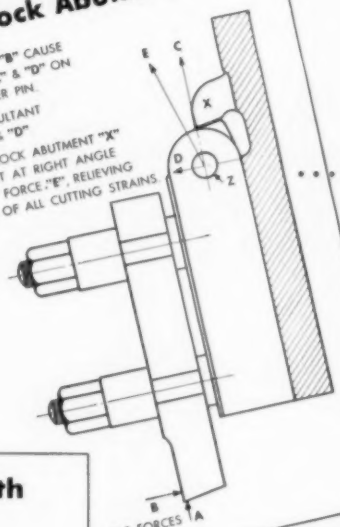


Exclusive Cincinnati Hypro Tool Block Abutment

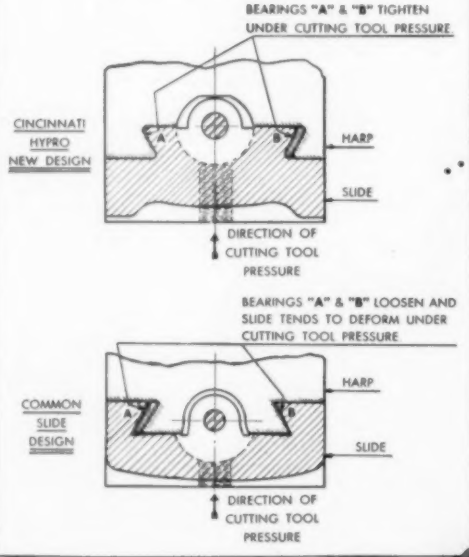
(1.) CUT FORCES "A" & "B" CAUSE ACTING FORCES "C" & "D" ON CLAPPER BOX TAPER PIN.

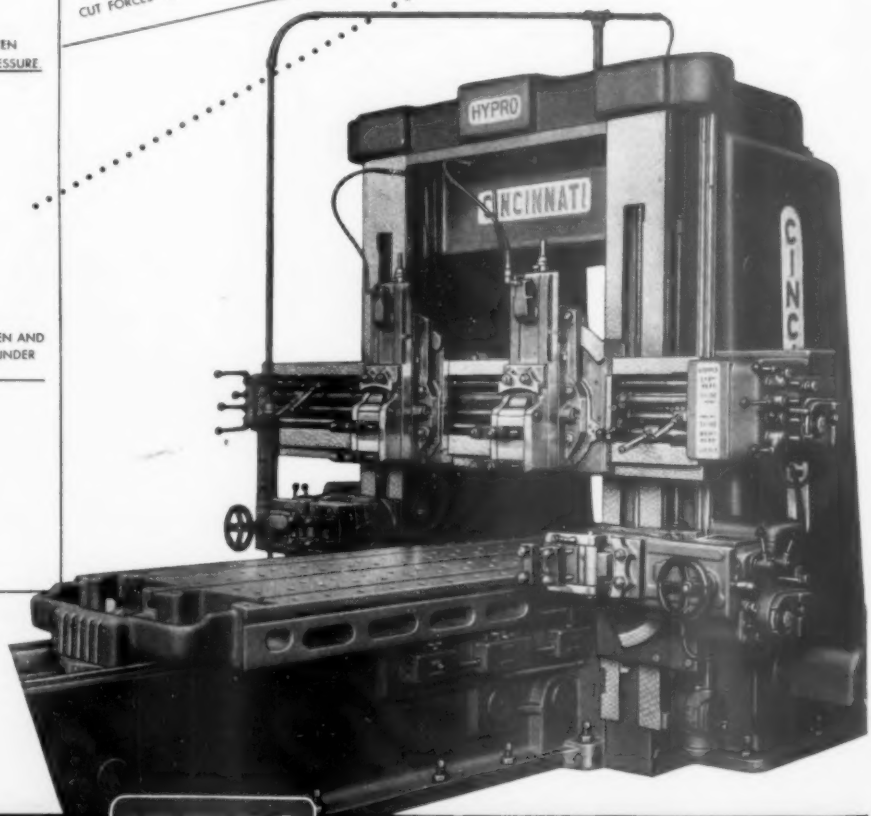
(2.) FORCE "E" IS RESULTANT OF FORCES "C" & "D"

(3.) HYPRO TOOL BLOCK ABUTMENT "X" IS PRECISION FIT AT RIGHT ANGLE TO RESULTANT FORCE "E", RELIEVING TAPER PIN "Z" OF ALL CUTTING STRAINS



Full Bearing Slides with Inverted Dove-tail

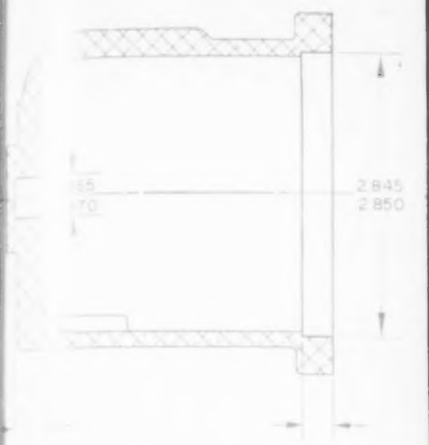




THE CINCINNATI HYPRO PLANER COMPANY

PLANERS · BORING MILLS · PLANER TYPE MILLERS

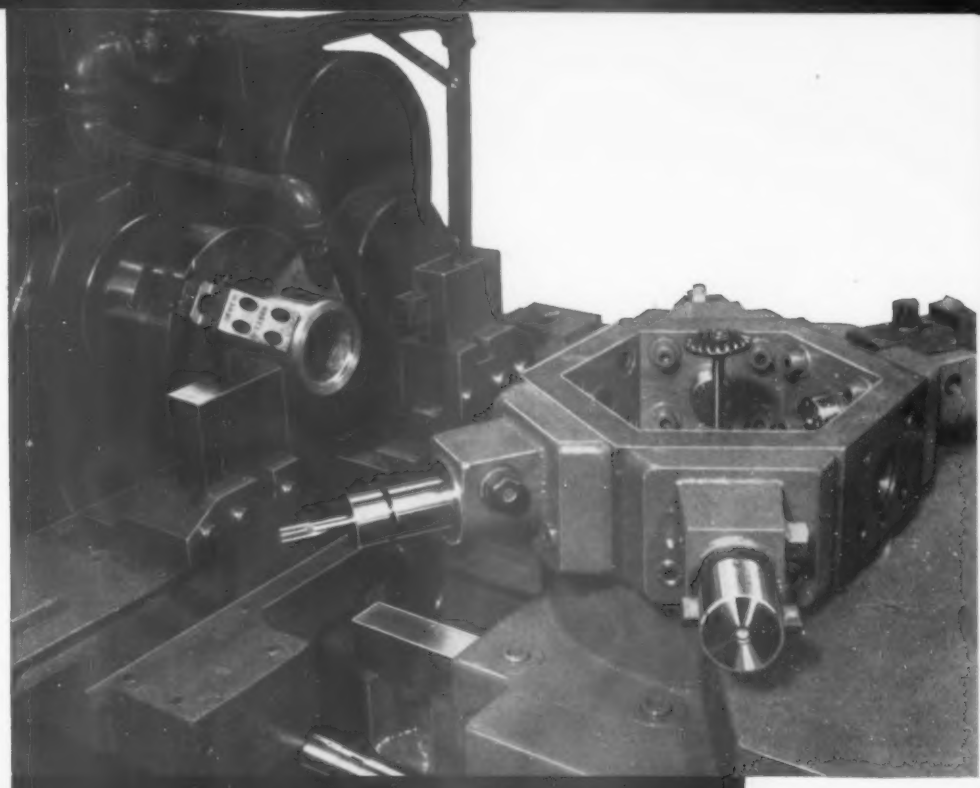
CINCINNATI, OHIO

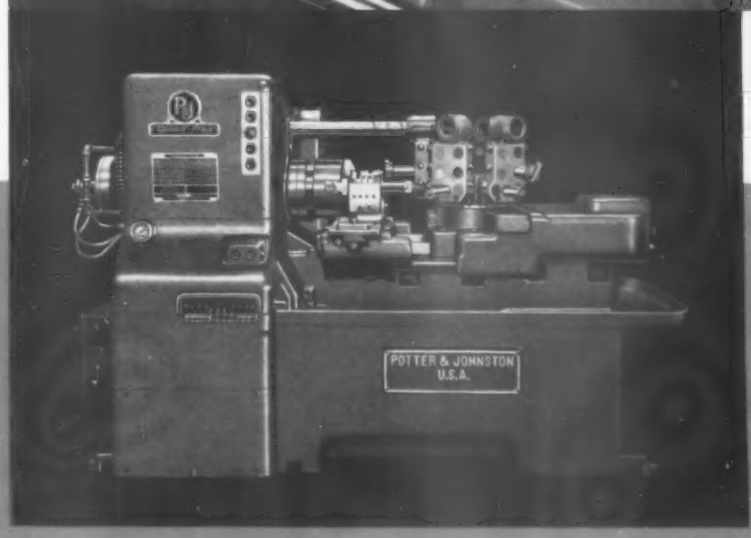


THE PART . . . *Die cast aluminum governor body.*

THE METHOD . . . . *Closed end to spindle, grip on body with two fixed and one swivel jaw.*

THE MACHINE . . . .



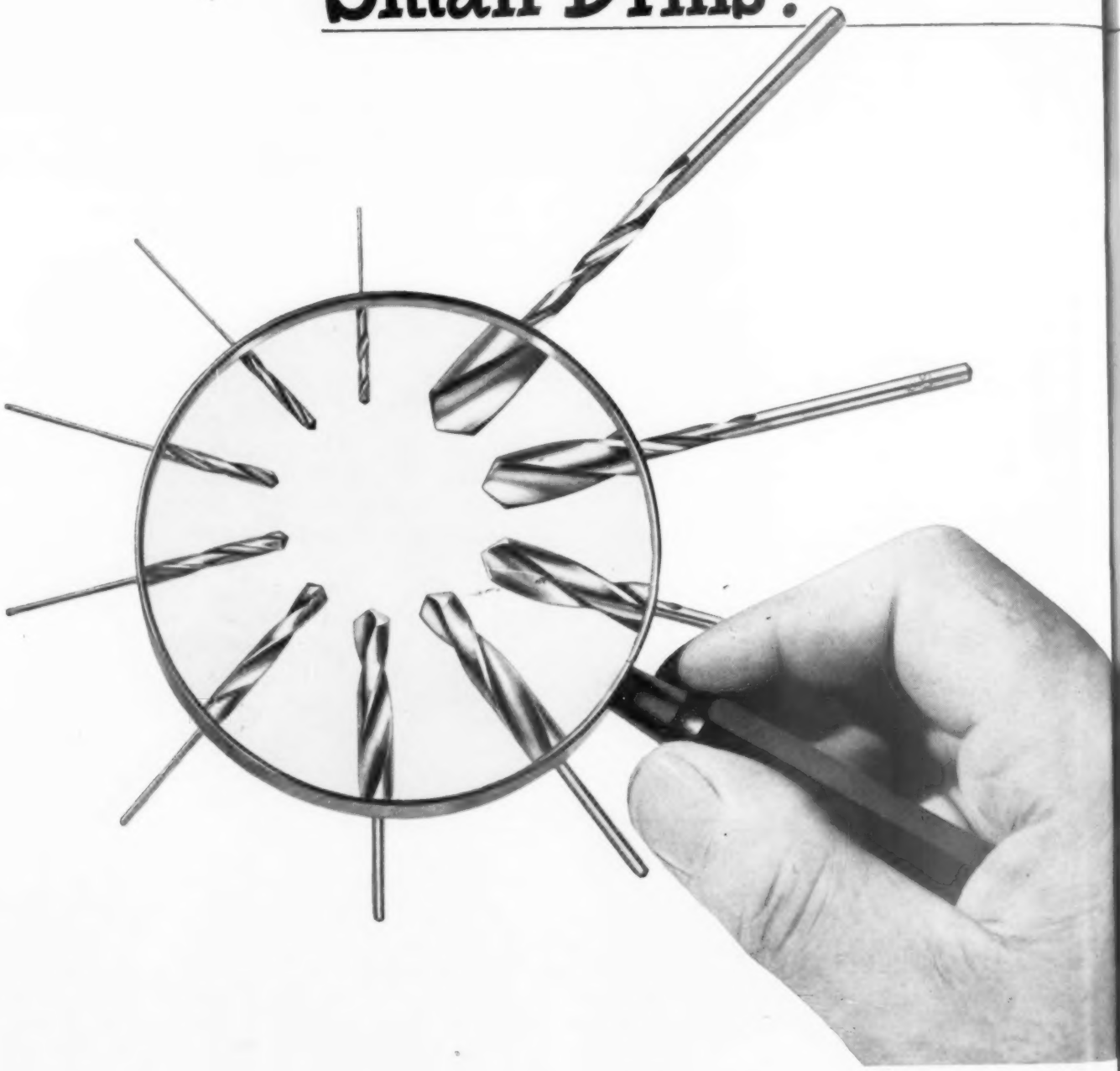


3-U SPEED-FLEX

AUTOMATIC TURRET LATHE. This is another in our series showing production data on machining ferrous and nonferrous castings and forgings up to 6" dia. on the new P.&J. 3-U SPEED-FLEX. In this instance the part is a die-cast aluminum governor body. Because the casting is variable in form, and because concentricity between the small blind hole and the large counterbore is essential, the design of the chuck jaws is vitally important. Thus the arrangement of one swivel and two chuck jaws to hold the part insures (a) that the casting is accurately located, and (b) permits quick chucking action. For this particular subject the spindle speed is set at 1445 R.P.M. for all operations, and the feed per revolution is fixed at 0.006 inch. Cutting speeds, however, vary with the different diameters being turned. The final result is a production of 67 pieces every hour! As a matter of fact, the full possibilities of the 3-U SPEED-FLEX have yet to be determined. It combines flexibility with speed of operations to permit fast, automatic machining of many types of small parts that formerly were finished in several machines. Perhaps you would like to check some production data yourself. Send us a blueprint, or the part itself, and we will send you production figures that will give you a better insight into the possibilities of POTTER & JOHNSTON'S NEW 3-U SPEED-FLEX AUTOMATIC TURRET LATHE.

Potter & Johnston Machine Co., Pawtucket, R. I.

Magnifying Glass Shows Clue to Lower Costs with Small Drills!



Morse "Multi-Inspection-Test-Control"

Provides Peak Small Drill Quality for ACCURATE Hole Size

We've placed these little fellows under the magnifying glass for a better look. Morse checks and tests and checks again, at every step of the manufacturing process. When a drill has been okayed by the Morse multi-inspection system, the user is certain of a small drill made to the closest tolerances — a tool that's dimensionally accurate with just the right degree of hardness and toughness — a drill that's scientifically ground and precision pointed.

Remember too, Morse small drills are *double-drawn* for increased toughness while maintaining their predetermined degree of hardness . . . and given special heat treatment to assure uniformity. Result: tools that appreciably lower small part production costs and step up "line" efficiency via *accurate* size holes drilled faster.

Whether your needs call for "bantam" size drills or the big Morse "block busters," Morse has the tool to cut down your costs. Your Industrial Supply Distributor can aid you in obtaining the proper Morse recommendation for *your* job on small or large drills and other high quality cutting tools.

Accuracy, Quality, Uniformity: the MORSE Code of Cutting-Tool Manufacture

MORSE TWIST DRILL & MACHINE COMPANY

The Original Manufacturer of Twist Drills

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Let the Machine Talk

by C. W. Kennedy

Samples from the machine forecast quality and anticipate inaccuracies

THERE ARE SEVERAL LEAVES in the quality control engineer's book that tool, methods and production engineers might profitably copy from. They may bring up the forbidding words "statistical methods," but that's nothing to be frightened over. Compare, for instance, the Gallup Poll, which employs practical and intelligent statistical methods, with the old-fashioned politician's "ear to the ground."

In devising new methods and shop setups, the usual object of course is the most production at the least cost, but many times the ability of the new arrangement to produce suitably within specifications is overlooked or ignored. Here, however, so many decisions are based on opinions that if facts—or a reasonable facsimile of them—can be substituted, the decision or action will be that much more valid.

Where a machine produces scrap and rework there are many arguments over tolerances, tooling or methods. Sometimes the material is blamed. Or the production quota rate, the design of the product or something else, all of which, mostly or usually, are matters of opinion. Why not let the machine itself talk? Maybe it could itself come up with a solution.

***Clifford W. Kennedy*, who is Quality Control Engineer with Federal Products Corporation, Providence, R. I., was graduated from Worcester Polytech in 1917. Serving as factory engineer with Remington Arms during World War I, he later joined the M. S. Wright Company, Worcester, where he successfully served as design engineer, service manager and, finally, as ass't sales manager.**

Rejoining Remington Arms at the start of World War II as chief inspector at the Denver Ordnance Plant, he became intimately acquainted with the application of statistical and other methods of Quality Control to the manufacture of components of military ammunition. In his present position with Federal Products, he has extended and diversified his broad experience in many plants throughout the country.

The quality control engineer uses a number of time saving sampling and statistical techniques which let the machine or process talk. His methods permit a remarkably accurate quality analysis of a production run—or a forecast of what an operation is liable to do—in terms of the specifications, the latter many times in a manner that seems uncanny.

A couple of these techniques require no prolonged application and involve no intricate mathematics; rather, they are absurdly simple in comparison to the value of the interpretation offered of the machine, process or operation capability. For instance, the cost saving gained in tooling up a certain centerless grinding job to a production greater than 1200 pieces per hour was considerably diluted, if not neutralized, by the resultant average of 4% undersize pieces, or scrap, and 15% oversize reoperation work.

The intent was to finish the main surface of a small shaft about eight inches long, holding a specified diameter of .4375″ to tolerances of —.0000″ and +.0002″. In order to meet such close final tolerances it had been felt, wisely, that the blanks supplied this centerless grinding operation should be more carefully prepared and an intermediate rough grind had been discussed and recommended—an extra operation entailing an investment in an additional grinder plus the sustained expense of another operation.

Control Starts at the Machine

Suppose, however, that an even wiser alternative was first tried?—that control at the screw machines where the shafts originated were to be questioned and analyzed, and any lack of real quality at that point overcome.

At the screw machines, the specifications called for a diameter of .439″ ± .001″. The first step in the analysis, therefore, is to pick out thoroughly at random fifty pieces from a morning's work at one of the screw machines and prepare to measure the diameter of each piece with a gage capable of reading to quarter thousandths.

Then, lay out a row of dimensional figures on a piece of graph or coordinate paper and draw in tolerance limit lines as shown in Fig. 1. As each piece from the fifty piece sample is measured, the exact measurement is tallied in the proper row in the manner indicated in Fig. 2. The first piece measured might have been .4385″, for instance, and would be tallied as shown at *a* in Fig. 2. If the next piece measured .440″, its tally would appear as at *b*. Where one piece might measure .4395″ and then another measure the same, for further example, they would be tallied as at *c* in Fig. 2. Then a .4375″ shaft as at *d*. And so on.

Continuing the measuring and tallying process, a diagram like that shown in Fig. 3 is secured, each tally mark representing the exact measurement of each one of the fifty pieces in the sample of screw machine work.

Such a set of tallies illustrates what is known in statistical language as a Frequency Distribution. A frequency distribution is an arrangement or classification of observations or measurements or data in the order of or frequency of their occurrence. When a set of tallies is outlined as in Fig. 3, the outline is known as a Histogram.

Just a glance at Fig. 3 tells a lot about the performance of the particular screw machine. Something in the neighborhood of 40% of the work is oversize and 10% is undersize—a total of 50% out of tolerance assuming that the sample is fairly representative of the morning's work. The screw machine was working, in fact, between tolerance limits of ± .003″ (from .442″ to .436″) rather than within the specified .439″ ± .001″.

The diagram of Fig. 3 provides evidence that there is too much variation among the screw machine blanks being supplied to the centerless grinder to hold successfully within the specifications of .4375″ and .4377″. There should be considerable doubt that even an intermediate rough grinding operation could overcome the sort of trouble so adequately illustrated. The major solution of the problem, therefore, is to cure the trouble at the screw machine.

Suppose, then, that another quality control engineer's graphic technique is tried. A new sheet of graph paper is arranged as shown in Fig. 1. This time, however, 5 pieces are taken directly from the screw machine, in succession as they are turned and cut off. The diameter of each piece is measured.

Rather than tally the measurements (as in Fig. 2), they are put down graphically in the form of dots in the manner shown at *e* in Fig. 4, each dot representing the measurement of a piece. Fifteen minutes or half hour later, 5 more successive pieces are taken directly from the machine and their dimensional variations recorded by dots on the chart. This system is kept up for several hours, perhaps for half a day.

Now we have another picture, in Fig. 4, of the sort of work the screw machine is doing. If the picture were condensed—i.e., if the dots were pushed together—the result would look considerably like the histogram in Fig. 3. However, Fig. 4 offers more or at least a different type of information than the histogram. It spreads the job out over a period of time. The ups and downs of the job are mapped. It forecasts impending out-of-tolerance work.

Follow along the chart of Fig. 4 to the 9:30 sample. The operator should have checked his work more carefully—certainly by 10:00 o'clock—and should have made the adjustment then that he put off until 10:30. Then he carried his adjustment too far and, for the next hour, produced undersize work or scrap as indicated in the chart, Fig. 4. Furthermore, the machine would have produced better work if the range—i.e., the between-piece spread of the work—had been kept consistently compact as at the start of the morning rather than as at noon.

The disadvantage of the progressive diagram of Fig. 4 over the histogram of Fig. 3 is that a half day, for instance, was more or less occupied in securing the data for Fig. 4, whereas a sample could be taken, the pieces measured and a frequency diagram or histogram could all have been made together in a short period of time.

The histogram and the dot chart (Figs. 3 and 4) offer a graphic illustration of what the machine is doing, at least during one morning. The same sort of analyses can be repeated during other production periods until the investigator is satisfied that he has a complete and typical picture of the condition of the average output. It is like drawing a street map or making a floor plan; much is then seen that was not apparent before and some direction is secured as to how or where to proceed.

Investigate the Causes

While a histogram or chart shows what is happening, it does not necessarily analyze or detail why, where or how. The latter questions are answered in a normal mechanical investigation of causes. Loose or worn cams and control mechanisms on the machine must be examined, and the type of tooling. Perhaps, too, the machine needs overhauling; also, what the operator does or fails to do should be studied.

Following on in the same shop several days later, after the mechanical causes of trouble had been ferretted out, a histogram made of a sample of the machine's output then showed a relation of the work in respect to the tolerances, as illustrated in Fig. 5. Compare this distribution with the one shown previously in Fig. 3.

Now, an obviously more compact arrangement of the work is available for the final grinding operation. With the great majority of pieces clustering around .439″ and .440″, the

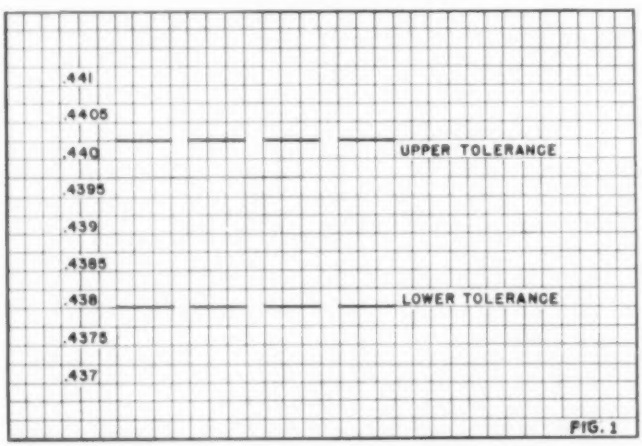


FIG. 1

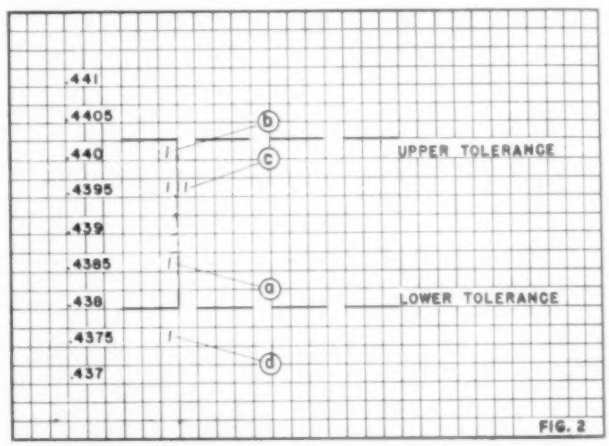


FIG. 2

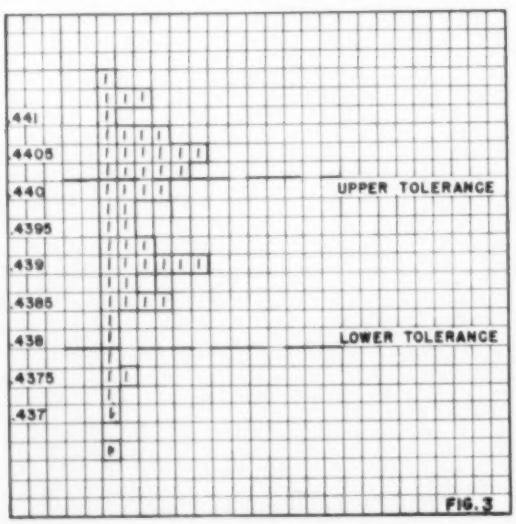


FIG. 3

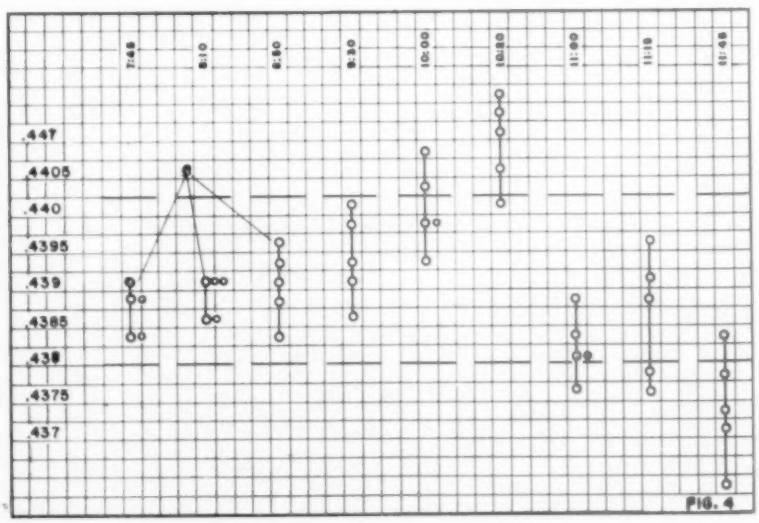


FIG. 4

grinder can be set more accurately, stay set longer and get out its work faster.

Using the same technique, a study was made at the grinder. In the first test, a hundred pieces were measured and tallied and a histogram—like *f* in Fig. 6—resulted. More attention to the grinder and continually increasing care on the part of the operator, plus the corrections in screw machine blanks described above, forced the distribution of grinding machine variations steadily into the more compact pattern of *g* in Fig. 6.

While the example used here has to do with metal cutting and gaged dimensions, the technique of analyzing an operation, method or process by means of histograms is readily applied to almost any other manufacturing routine where, with a little imagination and ingenuity, means can be devised for measuring process variations.

Rockwell or Brinnell readings on specimens from a hardening or annealing operation, for instance, if made into histograms, will often disclose a lack of furnace uniformity that, previously, may have been entirely unsuspected. Other examples come readily to mind, as where viscosity or tensile strength may be the variable and critical factors. Histograms are used to analyze and control the adjustment operation on batches of starting switches where the matter of timing is an important element, or to help in the regulation of accurate performance of package filling machines.

Converts Opinions Into Facts

Use histograms to settle arguments or convert opinions into fact. For example, Fig. 7 illustrates a condition where the temperature of a blackening process had been held responsible for warping certain die castings. Some forty pieces were taken at random from a batch of 5000 at the turning operation. These were measured and tallied as shown at *h* of Fig. 7.

After the batch had been blackened, another tally was made of another random selection of 40 pieces with results diagrammed at *k*, Fig. 7. Since the two histograms were so nearly alike (the minor differences between them could be assigned to natural variations in the lathe job or to errors in gaging the sample pieces), it was correctly decided that the hot dip had no appreciable effect.

Compare the simplicity of this technique with the effort of tagging, stamping or otherwise trying to identify an experimental or pilot batch. And trying to find the same pieces after the blackening process! Inevitably, it would seem that a specially designated group of work will get completely lost from a production line.

Again, pilot lots or small experimental batches fail many times, if sent separately through the process, to acquire the same sort of troubles and diseases that the subsequent regular production is exposed to. By using the histogram technique, analyses can be secured under normal, not special, conditions.

To summarize the mechanics of the quality control engineer's frequency distribution technique:

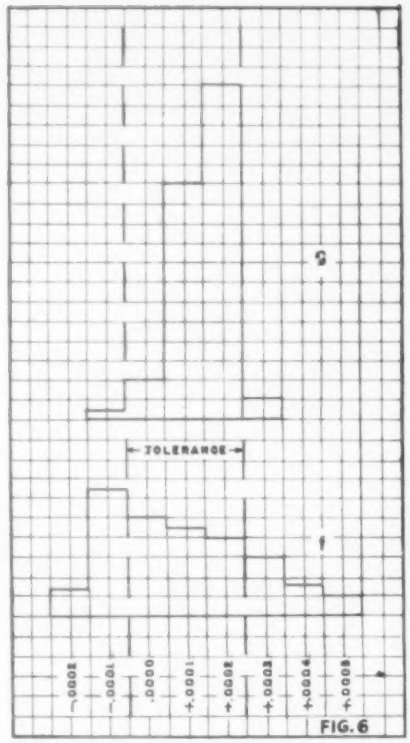


FIG. 6

(1) Take a random sample, 50 to 100 pieces in size, from a typical production run or lot. If the process is continuous (like strip, rolling or drawing), if discrete pieces of the product are not secured, arrange the equivalent by securing 50 to 100 random observations from different points on the total length of strip produced in a period of time.

(2) Prepare some means of measuring variations of the characteristic being investigated, using a gage, scale, timer, voltmeter, or other measuring or timing device. In order to use a frequency distribution analysis successfully, the measuring device should be able to detect an amount equal at least to one fifth of the total specification spread. It is better when the tolerance can be subdivided into ten parts.

(3) Prepare a graph, showing figures and lines for the tolerance or specification limits and 5 to 10 subdivisions between the specification lines.

(4) Measure the desired characteristic on each piece in the sample (or each section of the strip) and tally each measurement in its proper graph paper square, thus securing the so-called frequency distribution.

(5) The analysis is made visually a little clearer if the frequency distribution is outlined (review Fig. 3) to form the histogram.

(6) Where an even more detailed study of a production run is desired, take samples or groups of observations, 5 at a time, at regular and frequent intervals (every quarter hour, say) and use the dot chart technique (Fig. 4 in the preceding) for the graphic analysis.

Considerable space could be devoted, here, to a more or less academic discussion of the interpretation of histograms and dot charts. It will be found, however, that the best way

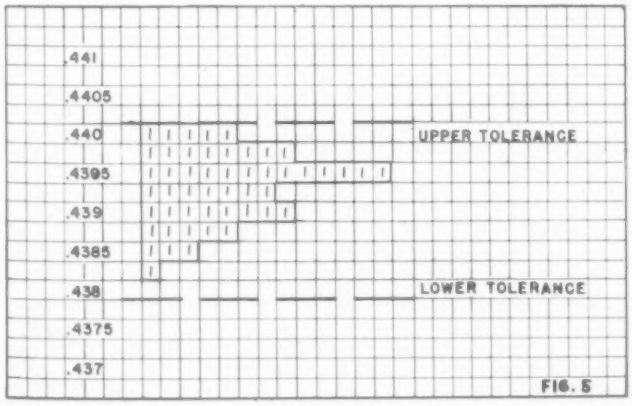


FIG. 5

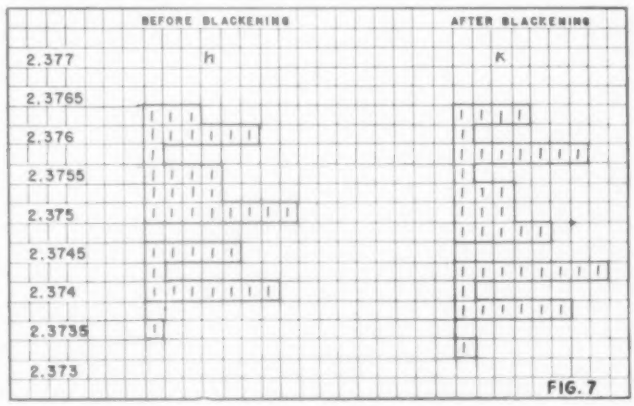


FIG. 7

to learn the mechanics of these techniques and to acquire skill in interpretation is to go out on the job and sample, gage and tally.

There are, of course, many industrial situations where variations in a single characteristic of some product cannot be readily measured, or where the success or failure of the operation or process is determined from the outcome of several characteristics simultaneously. Then, the decision concerning the success or failure must be based on the number or percentage of defective pieces—i.e., on the amount of substandard work—as compared to the corresponding quantity of satisfactory products.

Various Factors in Control

Experiments on a certain plastic molded article afford a good illustration. Changes in the plastic material itself, differences in temperature, and alterations in the molding apparatus all had their effect in a jumbled sort of way on the appearance, strength and dimension of the molded pieces coming from the process. A so-called standard or "control" batch would be run and the more unsatisfactory pieces in it would be counted as defectives. Then a change would be made in the process and another batch run.

Again the count of unsatisfactory pieces was taken. At each step of this cut and try development a decision was needed as to whether or not the latest process change had brought about any improvement. The most practical basis for such a decision, each time, seemed to be a count of the unsatisfactory pieces appearing.

Where, in a case like this, an experimental batch is run and, again, around 50 pieces in the form of a random sample can be taken from it, the following formula can be used to reach a conclusion as to whether or not the work represented by one sample is significantly different from the work represented by another sample.

	Good pieces	Bad pieces	Total pieces
Sample No. 1 (old process)	a	b	a+b
Sample No. 2 (new process)	c	d	c+d
Compute:	a+c	b+d	N

$$\frac{(ad-bc-N/2)^2 N}{(a+c)\ (b+d)\ (a+b)\ (c+d)}$$

If the result of this computation is less than 5, the chances are nine out of ten to the good that no significant difference exists between the two processes despite any disparity in sample results.

In the case of the plastic parts, a sample of 60 pieces was secured from a certain run. Of these, 5 were considered defective or bad and 55 as good. Then an experimental change (a hoped for improvement) was made in the process. A sample of 90 pieces from the second batch disclosed 14 bad pieces and 76 good ones. Applying these datum, in the formula above, a computation like the following was secured:

	Good pieces	Bad pieces	Total pieces
Sample No. 1 (old process)	(a) 55	(b) 5	(a+b) 60
Sample No. 2 (new process)	(c) 76	(d) 14	(c+d) 90
	131	19	150

$$\frac{(55 \times 14 - 76 \times 5 - 75)^2 \times 150 = 1.11}{131 \times 19 \times 60 \times 90}$$

Since 1.11 is less than 5, the engineer was at least 90% correct in assuming that the experimental process alteration had produced no significant improvement, certainly at least as far as the count and comparison of defective units were concerned.

Although 14 defective pieces out of 90 seems, offhand, to compare unfavorably with 5 pieces out of 60, and though the engineer might conclude that the new experiment had made matters worse, he is warned by the statistician to stick by the conclusion that no particularly significant change had been effected either way in this case despite appearances.

It must be remembered that either of the experimental runs were really only samples of continuous production; also, that samples were taken from these batches. More often than not, any sample supplies an inaccurate report of the aggregate it represents and the mathematician has made use of his permutations, combinations and laws of probability in guiding the engineer to a more correct conclusion by the above formula.

The engineer then made another experimental alteration in the molding method and sampled the result. His sample showed 48 good pieces and 2 bad pieces. This third process seemed to represent a significant improvement but, again, the result was tested with the formula. Comparing the result, statistically, of this third process with the immediately preceding experiment or second process, the computation worked in detail as follows:

	Good	Bad	Total
Sample No. 2 (2d process)	76	14	90
Sample No. 3 (3d process)	48	2	50

$$\frac{(76 \times 2 - 48 \times 14 - 70)^2 \times 140}{124 \times 16 \times 90 \times 50 = 5.46}$$

Since the result of the computation proved to be greater than 5, the conclusion was reached that the third process was significantly better than the second method.

Experience a Good Teacher

Employing the test formula similarly to compare the third trial, where 48 good pieces and 2 bad pieces appeared in the sample, with the original or control run (55 good pieces and 5 defective pieces), the formula computation gave a result of 1.83. Hence, again, the conclusion was reached—i.e., as far as sample results could report—that while the third trial showed the experimenting to be on the right track, perhaps, further attempts would be needed in order to show decided improvements over the first process.

In conclusion, the engineer responsible for tooling, equipment, methods or design is urged to dabble, at least a little, in the statistical techniques just described. By means of them, he will add to the judgment, gained from experience, the orderly analysis the statistician uses and will secure a clearer picture of how an existing job or an experiment is producing.

The record secured from graphic analyses, or from sampling and the "significance" formula, will provide a sound basis for comparing existing with proposed or experimental process changes. Many times, he will be saved from the misjudgment of private opinion. The little statistical approach described in this article, then, may allow him to substantiate some practical improvement in production methods he has devised or, perhaps, to discard what seemed to be a brilliant proposal before he has stuck his neck out too far.

More Power to America

AMERICAN INDUSTRY, which has been handicapped by a power shortage of late, may now look forward to relief as the General Electric Company plans to produce turbines capable of generating more than 9,500,000 kilowatts within the next four years. This announcement is of considerable importance since hydro-electric power has proven entirely inadequate to meet the demands of late industrial expansion. Turbines capable of delivering over 8,700,000 kv will be manufactured in the G-E Schenectady plant, the balance from Lynn plants.

by **Louis J. Lovisek**

34-92000

The Design and Function of a Sliding Cone Punch

Improved Tools Meet Requirements of Parts That Are Difficult to Produce

MORE PRODUCTION! BETTER QUALITY! These are the orders given to the manufacturing departments by management today. More production or more individual productivity is needed to stave off the threatening inflation and to widen the ever-narrowing belt of profits. Better quality is needed to secure a place for the company in the competitive days ahead. These instructions are most difficult to execute today because of the complexity of modern designing which requires parts that are more difficult to produce. To complicate the matter further, the productivity of the individual worker has been slowly decreasing.

In the cold forging industry, the pressure of such demands has resulted in increased popularity of the sliding spring punch for the first coning operation. While this tool is not new, its use had been limited to special applications. Now its uses have been multiplied to a point where some companies are employing it to manufacture even the simplest shape.

Louis J. Lovisek **studied engineering at Brooklyn Polytech, serving as instructor while working toward his degree. Employed for several years as draftsman by the E. W. Bliss Company, he later joined the Parker-Kalon Corporation where, inventing new methods for manufacturing socket and self-tapping screws, he was promoted to Chief Engineer.**

Until a few years ago, the most popular coning punch used in wire forging was the solid type punch (Fig. 1a). This tool consists of three parts: the body, the backing plug, and the pin. The body is made of a short length of round steel with an opening passing longitudinally through it; this opening is in the form of a tapered cavity and a straight hole. The largest diameter of the tapered cavity is made approximately 1.4 times the wire size to be forged. The sides of the taper are at approximately six degrees terminating in the straight hole, which is made to the wire diameter. The pin is made slightly shorter than the straight section in the body. When the tool comes in contact with the wire, the wire is upset first at the smallest diameter of the tapered cavity. As the action continues, the material gradually fills out the entire cavity.

Also in common use was the spring coning punch (Fig. 1b). This tool consists of four parts: the body, the pin, the backing plug, and the spring. The body is very similar to the solid punch with the exception of a deep counterbore in the rear of the tool. Into this counterbore fits the spring with one end pressing against the backing plug, and with the other end against the pin. To prevent its ejection from the tool, the pin is made with a shoulder. This pin acts as an injecting device for feeding short lengths of wire into the die. When the wire is seated in the die the continued pressure forces the pin against the spring. The tool then acts as a solid coning punch.

The sliding coning punch (Fig. 1c), the latest tool to find wide acceptance, is made of five parts: the retainer, the pin, the sleeve, the spring, and the backing plug. The retainer is a sleeve with a limiting shoulder; the pin is similar to the one used in the solid punch. The sleeve, which is the most important part of the tool, is the sliding member in the retainer. A hole is provided to allow the sleeve to slide on the stationary pin. At the working end of this hole, a cavity is made to permit the wire to form. In the conventional cold forging machine, such as a two blow heading machine, this tool is in the first punching position. The length of wire needed for the product is fed through the cavity into the pin hole. As the tool advances to the die, the wire enters the die. This motion continues until the end of the sleeve touches the die. The motion of the pin, however, continues and forces the material ahead of it to fill the prepared cavity. In the fully advanced position, the pin is even with the point at which the cavity starts.

Two Types in Use

There are two types of sliding punches in common usage: the "hit" type and the "free" type. The "hit" type of tool is designed to allow the back of the sleeve to make up solid against the backing plug when the tool is in its furtherest retracted position (Fig. 2). This action, known as "giving the material a set", permits positive pressure against all the material in the cavity. The "free" type punch does not permit any contact between the sleeve and the backing plug (Fig. 3). With this type of punch only spring pressure is exerted against the material in the cavity. The material is allowed to flow as it will, within the confines of the cavity. Selection of the type of sliding spring tool depends upon the requirements of the form to be made.

Why this gradual increase in popularity of the sliding coning punch? One reason is the ease of setting up the tool in the machine. Once it is operating properly, any worn or broken part can be replaced as needed, without any adjustments. Another reason is that it does not require extreme exactness in setting up in order to produce a satisfactory product. The setting-up of the solid punch requires exactness as any off-center condition is magnified in the product by the second blow. This magnification is the result of a large reduction in the height of the material by the second blow. Since the height of the cone made by the sliding punch is only slightly higher than the finished height, the magnification of off-center condition of the first punch is very small. It is easily understandable that with less adjusting time, more operating time is obtainable.

In the manufacture of difficult products, troubles can be encountered because of slight defects in the condition of the wire. A solid coning punch, using material that is out of round, will usually produce an out of round product. If this is not desirable it may result in idle machinery and dissatisfied customers. The sliding punch corrects this difficulty. The action of this tool, forcing the material gradually into shape, irons out most or all of the out-of-round condition of the wire to form a round cone. To further demonstrate the tool's value, the wire hole in the sleeve was made in two forms, hexagon and octagon. In each case the punch controlled the round material during the upsetting and produced a round cone, the only distortion on which was at the very top where the cavity of the tool meets the wire hole.

(Continued on page 24)

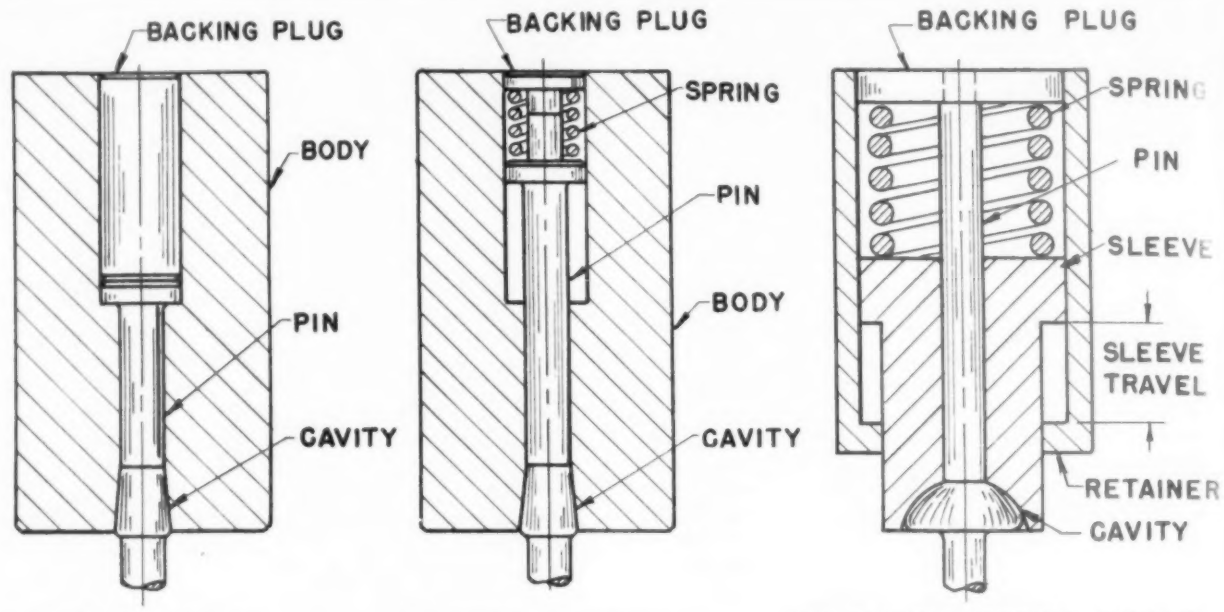


FIG. 1 TYPES OF CONING PUNCHES

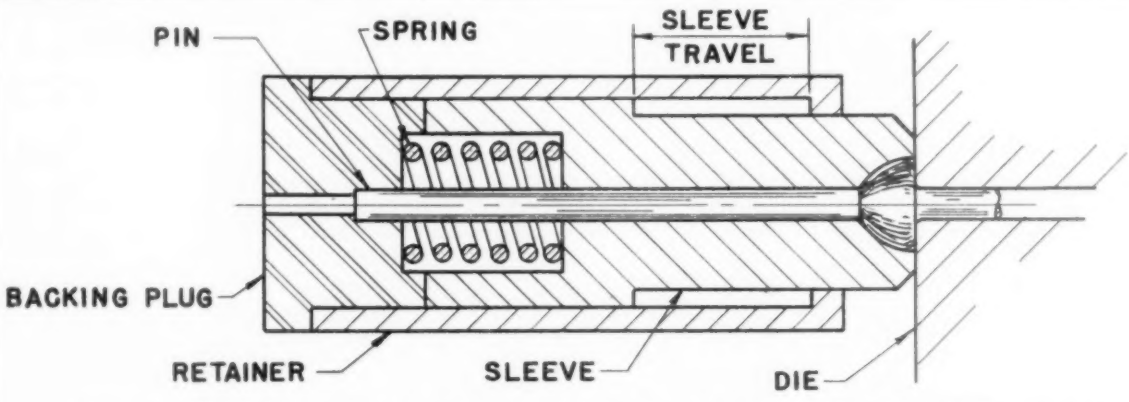


FIG. 2 "HIT" TYPE SLIDING SPRING PUNCH (RETRACTED POSITION)

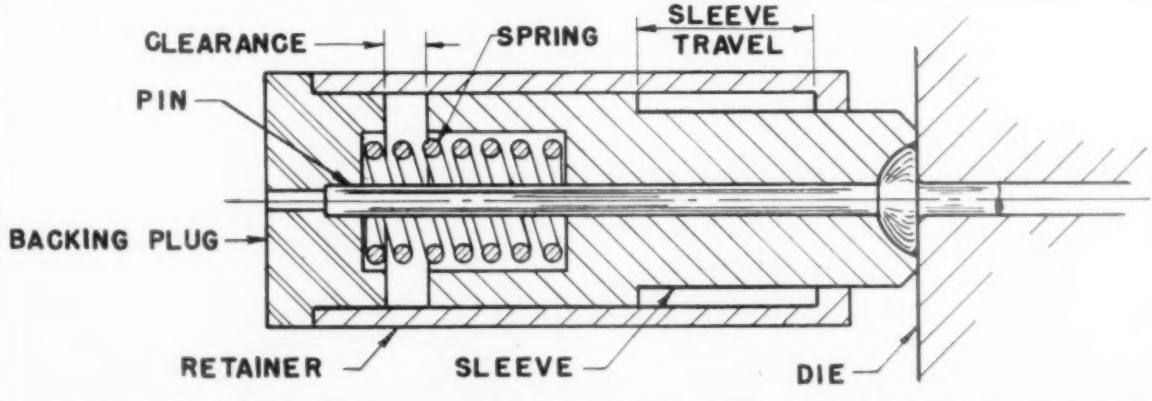


FIG. 3 "FREE" TYPE SLIDING SPRING PUNCH (RETRACTED POSITION)

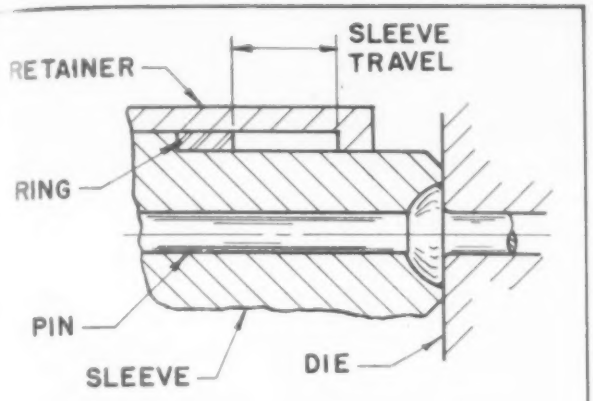


FIG.4 RING METHOD OF REDUCING SLEEVE STROKE

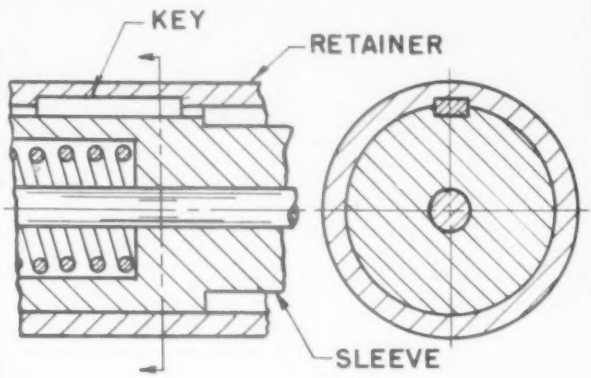


FIG.5 KEY METHOD OF PREVENTING SLEEVE ROTATION

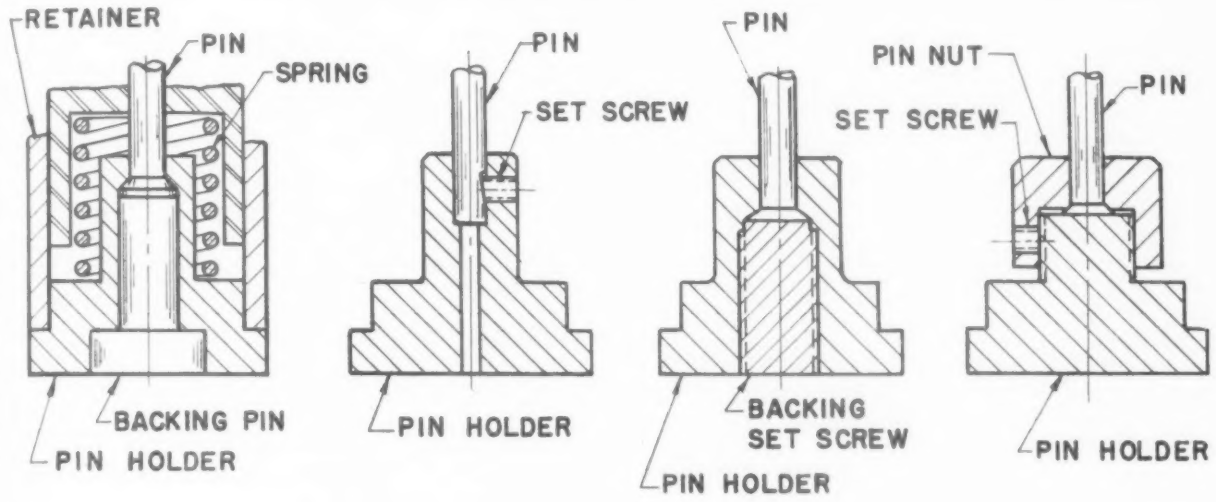
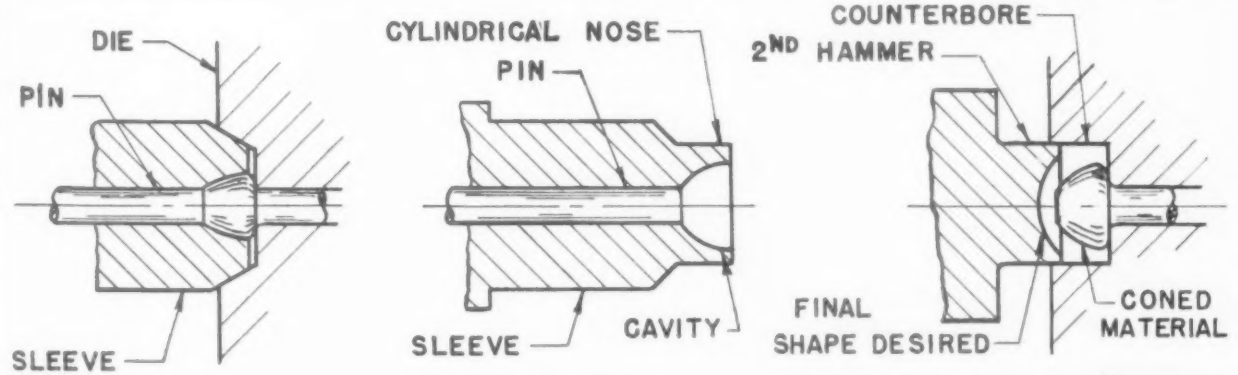


FIG. 6 METHODS OF HOLDING THE PIN



(A) METHOD OF POSITIVE LINEUP

(B) SLEEVE WITH CYLINDRICAL NOSE

(C) RELATIONSHIP OF 2ND HAMMER AND CONED MATERIAL

FIG. 7 AUXILIARY METHODS OF ASSURING TOOL LINEUP

Everyone who has ever attempted to upset five diameters of material with a solid cone punch realizes the difficulties involved. In fact, many companies have limited the material to be formed to four diameters to avoid such difficult, time-consuming setups. The sliding punch can handle five diameters of material just as easily as four, or three, or two diameters. The only limit to the volume of material that this tool can handle is the length of travel of the sleeve. Volumes of six and seven diameters have been successfully handled in production by this tool. For proper operations, the practice is to standardize the length of sleeve travel.

Reduces Distortion

One disadvantage of the sliding punch is the increased difficulty in attempting to feed a short length of material into the tools. In order to overcome this, a ring is placed on the smaller diameter of the sleeve before it is assembled with the retainer (Fig. 4). This reduces the length of the sleeve travel, which is permissible only if this reduced stroke can handle the volume of material needed. The ring can also be made of such a width to prevent any movement of the sleeve thus converting the sliding punch to a solid type punch.

Another method of overcoming the difficulty of feeding short lengths of material is to provide more clearance on the sleeve nose. To accomplish this and still have a strong tool, a key is fastened to the inner diameter of the retainer. The sleeve is grooved to the slide on the key (Fig. 5).

The solid punch distorts some of the fibres in the center of the coned material. This distortion is enlarged and in some cases ruptured, by the squeezing action of the second blow. A similar distortion is developed by the sliding punch, but of less magnitude. The second blow has little damaging effect, as the concentration moves only a short distance and results in a sounder forging.

The maximum material spread that can be accomplished without folding the fibers by the solid punch is a diameter equal to 1.4 times the diameter of the wire. The sliding punch does not have this limit; it can enlarge the wire to as large a diameter as the surface of the material can withstand. The difference in diameters between the cone form and the finished form can be interpreted as the amount of work required by the second punch. The cone diameter of the sliding punch operation is usually made a little smaller than the finished diameter required, and therefore results in a greatly reduced work requirement of the second punch.

The plastic flow action developed by the sliding punch leaves the material in a more pliable condition than the fiber distorting blow of the solid punch; or the sliding punch does considerable less work-hardening of the material than the solid punch. This condition, combined with the fact that a cone is almost formed to the finished shape, results in a sizing or ironing operation for the second punch. In the manufacture of critical or difficult forgings, where second punch manufacture is costly, it is desirable to prolong the life of this expensive tool as much as possible.

In the extruding operation, which is the process of reducing the diameter of the wire by forcing the wire along a taper, the solid punch applies the force at the opposite ends of the material, permitting a large length of material to be unsupported. Any increase in extruding friction as a result of poor wire coating or poor lubrication will cause the unsupported section of material to upset and fill the punch cavity without completing the extrusion operation. More material than is necessary to fill the cavity results in a broken tool. When the coning punch breaks, the second punch usually breaks too. The sliding punch provides an additional supporting section for the wire, thereby reducing the possibilities of such an accident.

Another limitation to the sliding punch is its inability to make high cones. The depth of the cavity, or the length of wire that can be left unsupported, is limited to the self-supporting strength of the material. Bright basic wire can be self-supporting under such conditions for a length of approximately two diameters. By redesigning the cavity of the sleeve, this limitation can be extended. When the redesigned tool approaches the die it acts as a solid type punch until the sleeve touches the die. From this point on, the tool acts as a sliding punch. Such an arrangement can also be used when the travel of the sleeve is insufficient to control properly the volume of material needed.

Another means of obtaining higher cones is by the use of a "free" sliding punch with a weak spring and a reduced cavity. The smaller cavity is filled with material before the stroke of the sleeve is completed. The pin pressure forcing more material in the already filled cavity is transferred to the molded metal and acts against the spring moving the sleeve away from the die and providing more space for the material to flow into.

The most perishable part of the tool is the pin. Too much effort cannot be expended in the selection of the proper steel, usually high speed steel, and in its proper heat treatment, bearing in mind the nature of the material to be forged. Generally, the harder the wire to be forged, the tougher the pin should be. The means of fastening the pin in the tool are also very important; there are several satisfactory methods (Fig. 6), choice of which depends on the availability of space in the tool assembly.

The next most perishable part of the tool is the sleeve. Here also, high speed steel can be used although some practices have been to make the sleeve a multiple of parts in order to reduce the size of the part to be replaced. This permits a selection of steels and heat-treatments that will best suit the various conditions under which the sleeve is expected to work.

Effects Marked Economies

To insure correct line-up between the forging tools, the conical nose of the sleeve can be so machined as to fit into a conical recess in the die (Fig. 7a) allowing about .005 of an inch between the two tool working faces. This taper will cause the punch to line-up exactly with the die before any work is done on the material to be formed. By changing the conical nose of the sleeve to a cylindrical nose (Fig. 7b) and the conical recess in the die to a counterbore, the second hammer can be made with a cylindrical nose to effect its positive line-up. The counterbore must be of such depth that the second hammer enters the recess before striking the coned material (Fig. 7c).

A tool is no better than the way it is made and the way it is used. In order to obtain satisfactory results from the sliding punch, it must be precision made. A minimum of clearance should be allowed between the sliding members in order to insure in-line operations. Further to insure this straight line operation, the wire hole should be made larger than the wire diameter by .001 of an inch or less. Since the tool is inoperative without the spring, the best of quality must be obtained; the spring must be able to exert considerable pressure even after innumerable compressions. The whole tool must be attached to the punch block in such a way that the inner diameter of the retainer is not distorted so as to prevent proper functioning.

It may seem that the sliding punch is much more expensive to produce than the solid punch. This is true to a certain extent. The initial cost will be rather high; but replacement costs can be reduced below the cost of the solid punch. There is an additional gain in savings from the reduction of set-up time on the production machinery and in the increase in the life of other tools. Aside from monetary advantages, this tool will satisfy the first order of "more production", by virtue of precision tooling, flexibility and interchangeability.

by H. L. Smith

59-10000

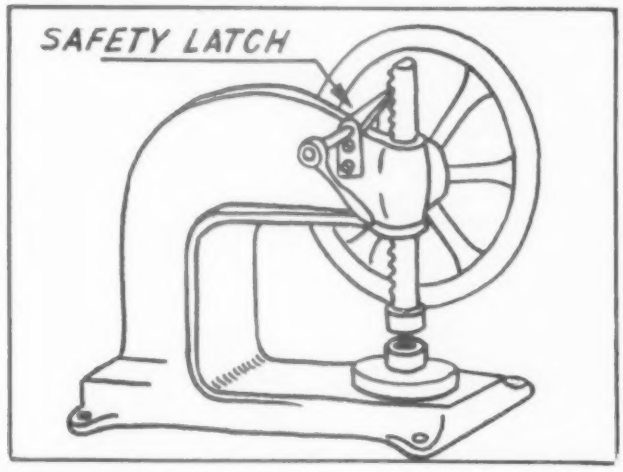
Industrial Safety and the Tool Designer

Anticipating Hazards is Tantamount to Taking the "Stitch in Time"

"I LOST THREE FINGERS, but thereby kept the other fellow from getting hurt." Thousands of machine operators who have received permanent impairments to their hands can make this statement, although they cannot prove it. They do know, however, that something was done quickly to eliminate or reduce the possibilities of it happening again, regardless of whose fault it was.

The chances are that the operator could have avoided the accident since, in all probability, he didn't have to expose

H. L. Smith, **who has been Safety Engineer at the Fort Wayne Works, General Electric Company, for many years, has made marked contributions to industrial safety. To a considerable extent, this article is a resume of a talk on safety recently delivered before Fort Wayne Chapter, ASTE.**



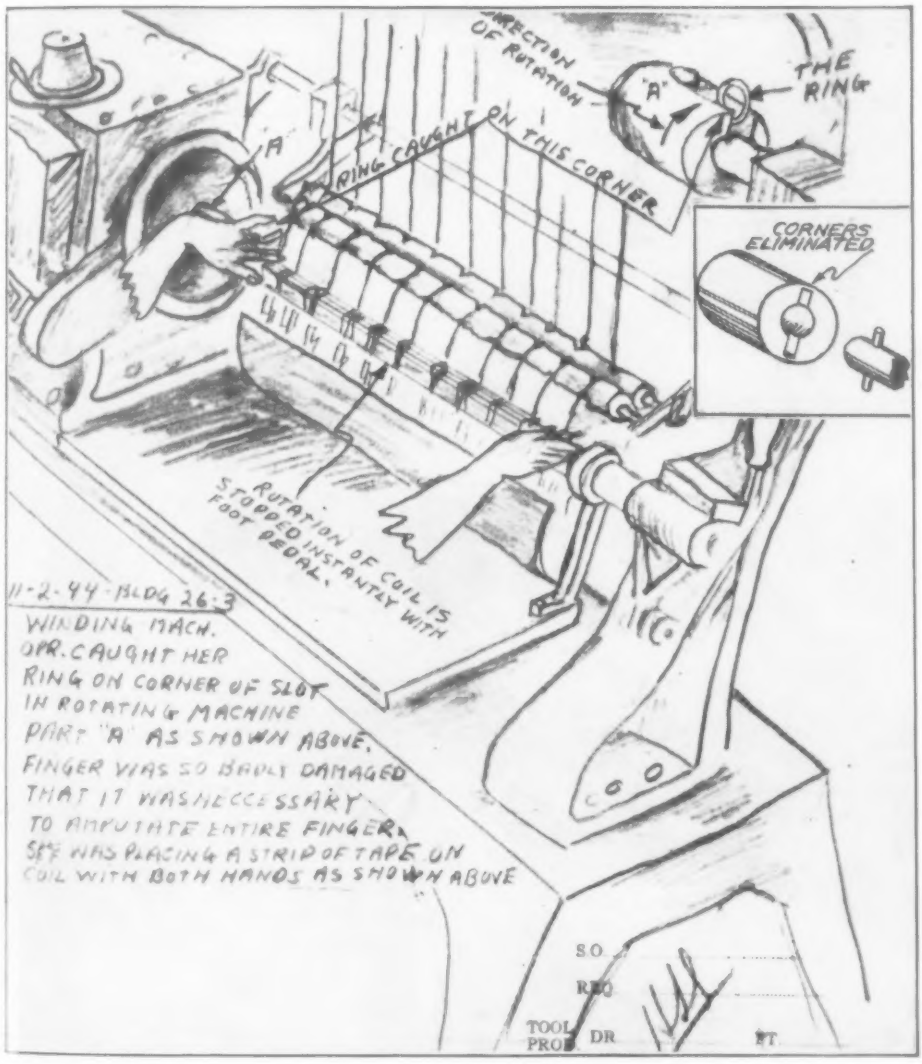
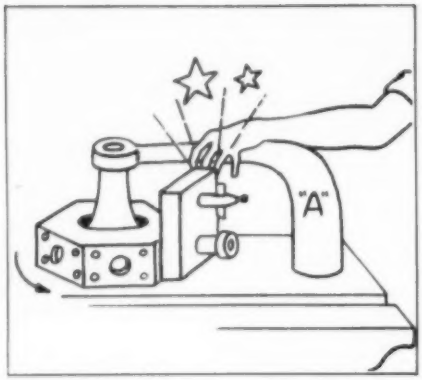


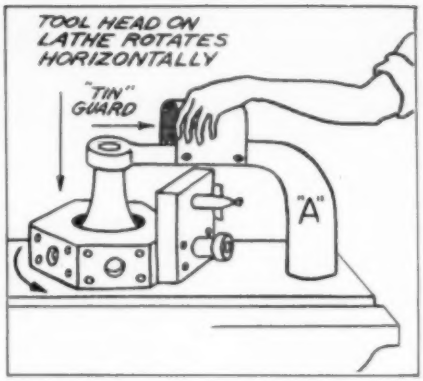
FIG. 1, above. Safety latch on manually operated arbor press must be released before ram can descend. FIG. 2, below. Record diagram of hazard and its correction. Reproduced "as is" from original by author.

his hand or fingers in the danger area. That, however, should not curb corrective action on the part of tool designers and safety engineers. To say that "We've got to keep them from getting hurt in spite of themselves" is perhaps too big an order, but safety-conscious tool engineers never stop trying to accomplish just that. But, what can the tool engineer do to help advance industrial safety? He has done much already, but his job keeps getting more difficult with the increasing complexity of machine design.

The relatively slow action of manually operated machines has been transformed into quick, snappy motions through the application of air, hydraulics, and other developments. But sometimes the safety devices don't keep up with the increase. Fig. 1 shows a safety latch on one of the oldest and still common type of "elbow grease" operated machines.

Unfortunately, however, the latch was installed after a female operater amputated the end of her finger. She just





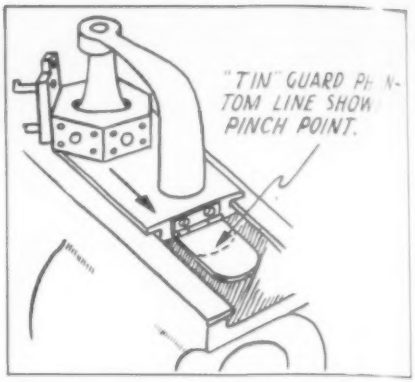


FIG. 3 (left). Shows how an operator can pinch fingers between turret and turret arm, and FIG. 4 (center) a simple guard. FIG. 5 (right) shows how a short guard could pinch fingers, and how the hazard was eliminated by lengthening the hinged guard.

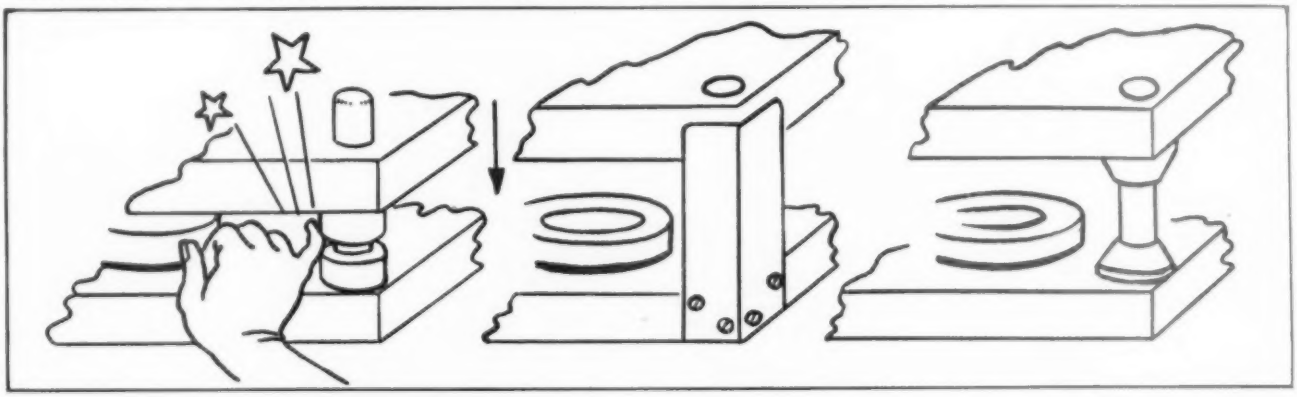
pulled down on the wheel before taking her finger from under the ram. When people lose fingers on a simple tool like this, what can be expected when they press a button or operate a valve to close the chuck, to bring in the tools, lower the ram, and so on and on?

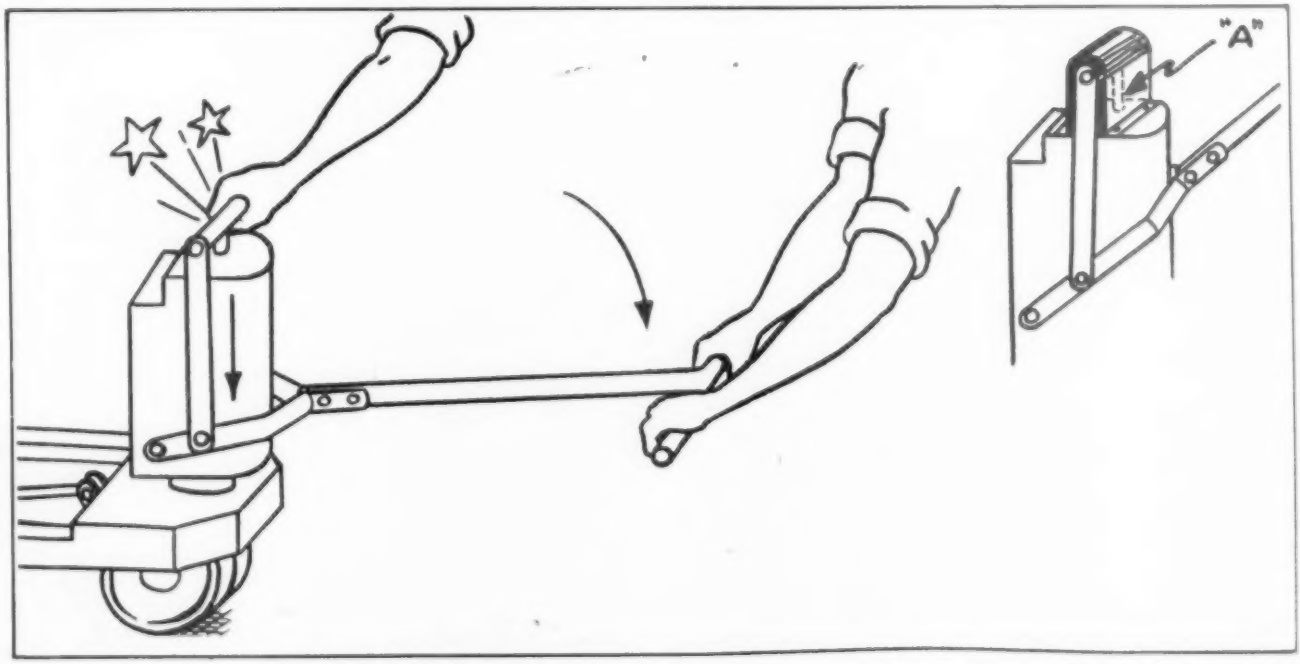
Statistics from "Accident Facts", 1946, published by the National Safety Council, are interesting and pertinent. As, for example:

"Machinery accidents accounted for one-fourth of all accidents which resulted in permanent partial disability. Reports from four state compensation commissions indicated that one-third of all such accidents involved just four different machines: *punch presses, grinding wheels, power saws* and *lathes*. Thumb and finger injuries totalled one-third of all permanent partial injuries arising from this source; injuries to hands totalled one-fifth."

Obviously, both safety engineers and tool engineers must pool their thinking to bring this rate down. It is, however, an unfortunate commentary that too often, the tool engineer and safety engineer don't get together except

FIGS. 6a, 6b and 6c, left & right (at top) shows finger pinched off between die guide pin bushings, an improvised guard which minimized the hazard, and the hazard eliminated entirely after the tool engineer had beveled the bushings. At bottom (FIG. 7) a worker pushed down the handle of a hydraulic left truck while another was pushing the truck at point "A." The result, a pinched-off finger. A simple guard eliminated the hazard.





when investigating an accident. They may decide on the proper mechanical correction to be made, and on this particular machine the hazard will be eliminated or guarded, but this may be as far as they will go. How about similar or identical machine hazards throughout their company and throughout the nation as a whole?

Someone, of course, had to be the first to lose a finger on a punch press, a grinder, or a lathe; but it may be safely assumed that a great majority of the accidents reported in the severity rates quoted above were "repeat accidents." This lack of profiting by experience is so real that, even after twenty years of safety engineering, the writer finds it is seldom necessary to render an opinion as to whether or not an accident hazard exists. Nearly always it is possible to find or recall where someone had an accident or near accident because of a similar condition.

Jewelry Can Become a Hazard

Sometimes it is almost impossible to anticipate a hazard. Look, for example, at Fig. 2. If asked for an opinion on the probability of a finger ring getting caught, as shown in the illustration, the writer would have considered it rather unlikely. Operators are not expected to wear rings when operating this equipment, but none of us had picked this as a hazardous point for special attention. Note the mechanical corrections made after the accident, which may prevent another or more serious one, especially when it is realized how difficult it is to keep women from wearing wedding and or engagement rings.

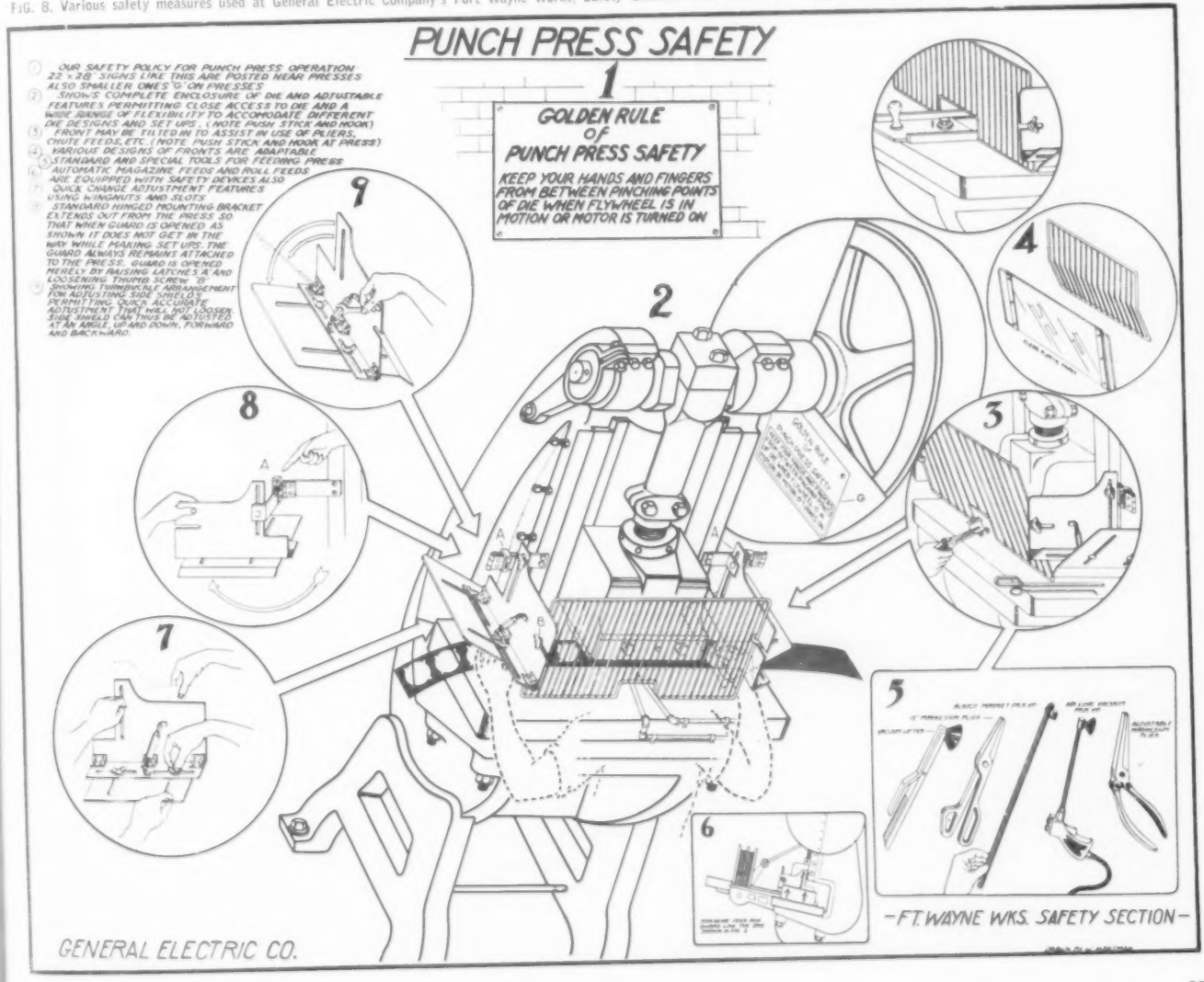
But unless safety engineers get such information to the tool engineer, he has to keep on guessing as to whether or not this or that feature is a hazard. If he has the accident story—not just a bunch of figures and statistics—before him, he will probably be able to eliminate the hazard. If that is not possible, a guard can be designed as part of the equipment—at any rate, the problem should not be solved by someone else hanging an unsightly piece of tin over the danger area.

Even among some tool engineers, the attitude has been: "Why in the name of common sense should anyone get hurt at a point on the machine where they had no business getting into?" Yet, Figs. 3, 4, 5, 6 and 7 show questionable or controversial types of hazards of the sort "no one has any business getting into." But, people do get into them, and that's all there is to it, and tool or safety engineers would probably do likewise if they were operators.

Most people are careful most of the time, but everyone is careless once in a while. So, it is necessary to eliminate or guard machine hazards to help the careful operator work safely, and the fact that a "foolhardy" chap goes out of his way to get hurt should not cause discouragement. Experience shows definitely that there is no such thing as "foolproof" guards. In fact, the writer never accomplished much in guard design until he quit trying to "make 'em foolproof." The only "foolproof" method is in the hands of the tool engineer, whose job it is to eliminate the hazard.

Once, an admonition on a poster read: "A bulldog's bite is mild compared to the bite of gears." But a poster with

FIG. 8. Various safety measures used at General Electric Company's Fort Wayne Works, Safety Section. This illustration suggests many ways of promoting safety in press room.



this message hasn't been used for several years. Why? Because modern machine tools just don't have exposed gears, and it's been several years since we recorded an accident from this hazard. Yet, it is necessary to guard against this hazard returning. It is similar to the present tendency of parents to not have their children vaccinated against smallpox because it is no longer a common occurrence.

Mr. Tool Engineer, why isn't it possible to do as well at the point of operation on the machines as has been done with respect to gears? True, it's a tougher problem, but surely not any tougher than designing the machine itself. Yet, an expert die designer, who has designed progressive dies which do almost everything except package the product for shipment in a single stroke of the press said: "You know, designing punch press guards was the toughest job I ever had. When I came here, that was one of my first assignments."

Incorporate Safety in Design

Granted that guards and safety devices at the point of operation are tough to design, let's eliminate every possible hazard by incorporating safety in the machine design, in tooling, and in methods. Again, granted that guards and safety devices at the point of operation are tough to design, then why not keep expert designers.—like the die designer mentioned—on as a guard designer? Safety is equally important with speed in manufacture; and experts should be in that field also.

Why is it that, when mention is made of "point-of-operation hazards," the conversation is often limited to power presses? Perhaps it is because, at the point of operation on most modern machines, there are hazards similar to those connected with power press—hazards that are apt to slip by unnoticed until an operator loses a finger or two. Reference should also be made to lathes, grinders, and other machines, if they have what may be termed the power press hazard.

Accident records reveal that these are not safe enough even for the careful operator if he is required to place his hand or fingers in the danger zone to load or unload and is required to trip the equipment by foot, or with one hand while the other is doing something else, or with conventional-type two-hand controls, with foot or hands, and depend upon mechanical device to knock or pull out hands, or with gate guard designed to fit operating valve or switch.

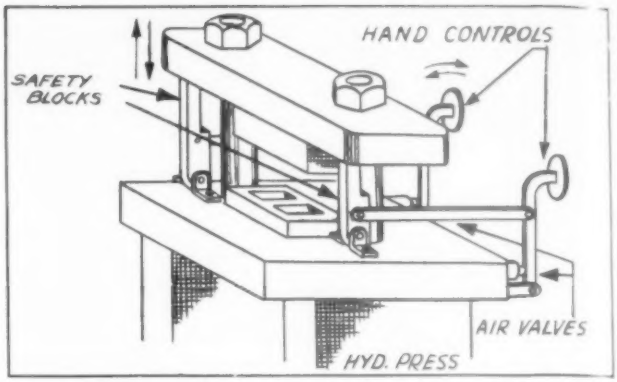


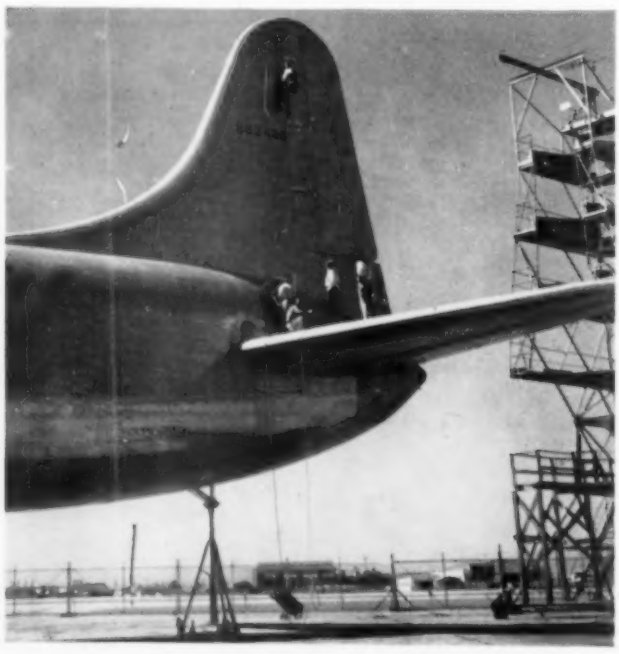
FIG. 9. Safety blocks under ram. Can be used with one or two air valves or operated with gate guard.

What can be done? Well, many things. With the help of tool engineers, methods and planning engineers, time study men and others, for instance, the need of going in the danger zone can be eliminated or minimized. Then, if it is necessary for the operator to put his hands in the danger zone (not permitted on punch presses), two safety blocks can be added as shown in combination with two-hand controls or a hinged basket guard. See Figs. 8 and 9.

While the above items are subject for lengthy discussions, they must nevertheless be considered seriously in order to reduce "point of operation" accidents. In addition to these, other plans and methods can be introduced, depending upon the circumstances at hand. All of them, however, should follow the old basic principal that a person is safer in industry than at home; so, let's keep on trying to "keep 'em from getting hurt in spite of themselves."

Inspectors Ride High at Convair

INSPECTING THE 57-foot-high tail fin of the world's largest land plane—the Convair XC-99, capable of carrying 400 passengers or 50 tons of cargo—presented quite a problem at the plant of the Consolidated Vultee Aircraft Corporation, San Diego, Cal. However, the problem was solved by rigging a boatswain's chair to the end of a block and tackle, the block being attached to a pulley built into the fin.



Using this time-saving method, which is now to be a permanent part of inspection and maintenance procedures on the six-engine job, a self-propelled inspector was able to check the lofty fin in jig time. The stand at right is especially built for use of employees who work on tail surfaces during final assembly of the 133-ton plane.

Aussies Seek Yank Know-How

Companies and individuals who are interested in exploiting the Australian market with products, ideas and production experience are invited to get in touch with an Australian telephone company, a research lab and a distributing organizatiion jointly interested in purchasing American designs and "know-how" on a royalty basis.

Of particular interest are household appliances, radio-electronic equipment, simple electrical devices and mechanical items which the Australians are equipped to manufacture. While principals will be visiting the U.S.A. shortly, preliminary correspondence is invited by Austin C. Lescarboura, Croton-on-Hudson, N. Y., who represents the Australian group.

by **Rex Heath**

34-10000

"News" on the Production Front—

The Latest in Cost Cutting Tools Make Their Bow to Industry

WHILE RADICAL ADVANCES in machine tool design may be said to have reached a temporary peak, there is nevertheless a consistent and progressive refinement that not only indicates future trends but gives a marked impetus to industrial progress, and while the greater number of these developments can be publicized in the new equipment sections of the technical press—as, for example, the Tools of Today department in *The Tool Engineer*—many cannot be confined to such comparatively limited description. At that, many a radically new development makes its initial bow to the industrial public in this department.

Among the "news" of considerable interest to industry is a quick-change lock, for spindle tapers, by the Giddings & Lewis Machine Tool Company, Fond du Lac, Wisconsin. This lock, which is shown in detail in photo No. 1, provides a positive means of seating and ejecting shank type cutters, arbors and adaptors without resorting to draw keys and drifts. It is available with the new G & L quick change horizontal boring machine spindle, shown in photo No. 2. As the illustrations show, the spindle is provided with a steep or fast taper socket and a simple built-in double acting screw locking device.

With this improvement, the operator can quickly mount cutting tools into the spindle (which is provided with a National Standard taper of correct size to meet spindle diameter requirements) by merely inserting the shank of the cutting tool into the spindle opening, or socket. Seating or drawing in the shank is then accomplished by tightening the single screw, which has both right and left hand threads, by means of a small T-wrench.

Tightening causes a wedging action between the lock segments and tapered notches cut in the adaptor shank, and the even distribution of positive locking pressure over the entire surface of the fast taper shank and the mating taper of the spindle socket holds the adaptor solidly and accurately in place. To eject, the lock screw is turned in the opposite direction, thereby breaking the friction and permitting easy and quick removal of the tool. This lock meets a demand, throughout industry, for a quick and positive means of seating and removing taper shank tools with a minimum of fuss and ado.

Interesting New Lathe

The lathe manufacturers, too, are consistently refining their tools, as evidenced by the new 18-inch and 32-speed Engine Lathe by the Sidney Machine Tool Company of Sidney, Ohio. This lathe (photo No. 3), which is superficially similar to the toolroom lathe shown in the Tools of Today department, January *The Tool Engineer*, is equipped with an all-herringbone geared headstock with 32 pre-selective spindle speeds.

An interesting feature is the unit construction. The lathe bed is cast of a steel-nickel-gray iron mixture and, as indicated in the illustration, is exceptionally rugged, being designed with the four longitudinal walls and double cross girts spaced at 12" intervals.

The gear box is fully enclosed, with all moving parts running in oil, and sixty changes of feeds from .0028" to .174", and sixty changes of threads from $1\frac{1}{2}$ to 92 are obtained by means of a convenient dial control. The spindle and long intermediate shafts are supported by anti-friction center bearings in addition to the conventional end bearing mountings.

The spindle is mounted in such a manner that it automatically compensates for changes due to thermal expansion and contraction and—also of considerable interest—the $\frac{13}{16}$" standard spindle bore may be increased to 5" without affecting the working parts of the headstock. A unique feature is that the 32 spindle speed changes are made available through use of only 16 herringbone gears.

The apron, designed for heavy duty, is of double wall construction with all shafts rotating in anti-friction bearings, and lubrication is entirely automatic from a centrally located pump and reservoir. All in all, the simple contour of the machine is not only indicative of ultra-modern engineering that produces a pleasing appearance, but provides plain surfaces for easy cleaning as well.

Eighteen New Models—Plus

As part of a complete new line of eighteen models, by the Heald Machine Company, Worcester, Massachusetts, the No. 233 Bore-Matic, the Model 271 plain internal Grinding Machine, and the No. 2 Tool Sharpener are shown respectively in photos Nos. 4, 5 and 6.

Taking these in turn, the Bore-Matics are furnished in two sizes, as a Bi-way, Models 232 or 332, and in two sizes as a Tri-way, Models 233 (shown) and 333. These machines are designed for borizing two or more holes from various directions simultaneously. "Way units", which may be disposed in angular relations to suit, may be operated separately, if desired, and up to three individual boring heads—or a special multi-spindle head unit—can be installed in each unit.

These machines include all of the development features of the entire new Heald line—motor and pump units isolated from the base; improved idlers and cylinders; and automatic way lubrication and refinement in hydraulics to provide smooth and constant feeds. Like all of the Heald Bore-Matics, these machines are engineered for precision boring, turning, chamfering, facing, grooving and fly-cutting operations.

Containing many of the basic development features of the new Bore-Matics is the new Model 271 plain internal Grinding Machine, designed to fulfill a demand for equipment suitable for small to medium lot production where an automatic cycle is not required. With that purpose in view, this machine features convenient quick setups for maximum versatility. The various elements of the grinding cycle can be accurately and rapidly set for rate and amount on the centralized control panel of the wheelbase cross slide by means of knobs and levers clearly marked to show functions.

Complementing the Bore-Matic line is the No. 2 Tool Sharpening Machine, designed to accurately lap edges to the correct shape. This is accomplished automatically, thereby eliminating the errors which are practically inevitable when tools are ground by hand. With this machine, accurate ad-

justment for any shape of tool can be easily made, after which the operator has merely to insert the tool in the holder and snap the switch. The tool is then sharpened quickly and accurately.

Constant Improvement

One machine which has undergone constant refinement since its introduction at about the turn of the century is the No. 12 plain Milling Machine, by the Brown & Sharpe Manufacturing Company, Providence, R. I. This machine, by the way, is of especial interest to the writer since it was the first machine he operated as an apprentice, 'way back when.

There is, of course, little similarity between the prototype and the ultra-modern version of today, shown in Photos 6, 7, and 8, except that the design principle has remained practically unchanged. Thus, the machine retains a distinctive individuality. However, the new machine has a new spindle power feed arrangement that provides greater output with fewer setups, permitting many milling cycles (with either 3 HPH or 7½ HP spindle drive) that require accurate lowering and raising of the machine spindle in conjunction with the regular table movements. Settings can be made to accurately position the cutter at two different heights, in any cycle, and to raise and lower the cutter several times during any cycle.

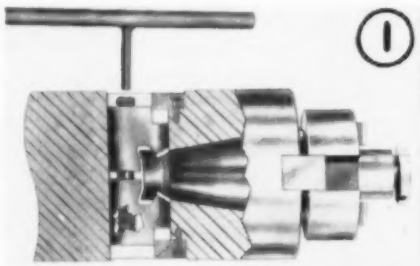
Two typical milling cycles, among the many, available with this machine, are illustrated to show how additional setups and handling may be eliminated. For example, milling three keyways, as shown in photo No. 8, requires that the cutter operate at two different levels above the table, while climb milling at both ends of the table, as shown in photo No. 9, requires a continuous cycle with the spindle head power feed being used to raise the cutters from the work which has just been loaded in the second fixture.

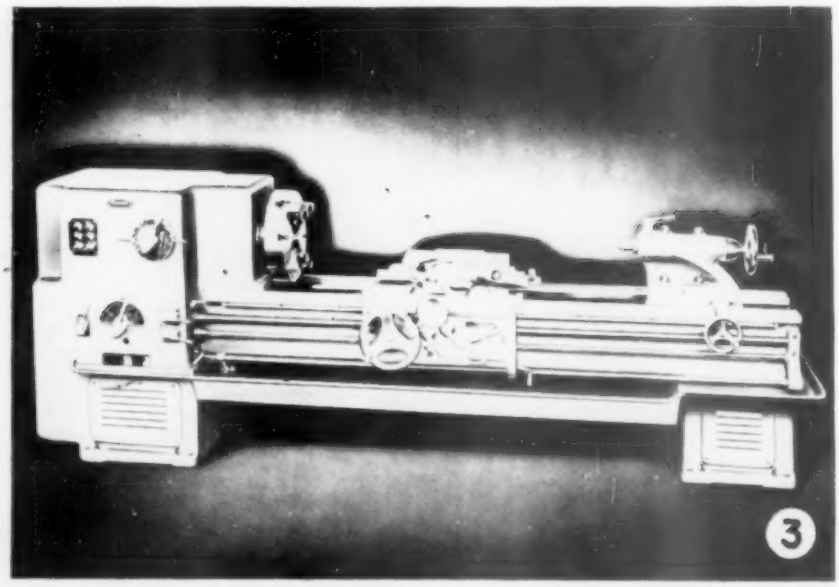
With the new design, spindle head feed rates are available from ½" to 7⅝" per minute, by use of change gears, and are independent of table feeds. The spindle head fast travel rate is 30" per minute. Drive is by brake-type motor, and dogs operate various electrical devices for controlling the arrangement automatically. Hand control is provided by knobs and buttons.

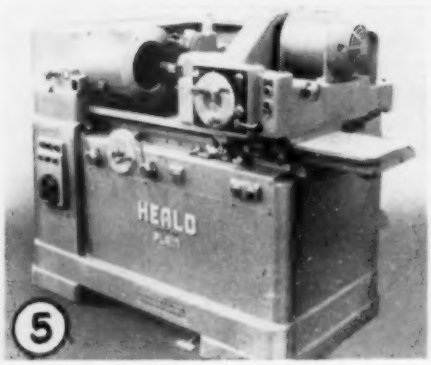
Shown in photo No. 10 are the Brown & Sharpe Nos. 10 and 12 plain grinding machines, now available with 10" swing to provide clearance for larger diameters and projections. Like the companion Nos. 10 and 12 machines, the new 10" × 18" and 10" × 30" grinders are designed for the rapid cylindrical grinding of small and medium parts to close limits on a production basis. On diameters up to 3 inches, many parts can be ground to limits of .0001" tolerance with consistent uniformity.

Once set up, since they are operated by very simple hydraulic and electrical controls, these machines can be controlled entirely by the cross feed handwheel and the table start-stop knob, as shown in photo No. 11. The grinding wheel spindle (photo No. 12) assures rapid, trouble-free precision grinding, with spark-out time at a minimum due

Photo No. 1, cast resin gear and pinion reproduced from production gears "without shrinkage," for production patterns. Advantages:—light weight and ability to receive gears from sand without draft on gears. Photo No. 2, cast iron match plates for 16" x 18" flask and cast iron core box for worm gear. Left to right, Photo No. 3, cast resin match plates for 12" x 16", 10" x 22", and 10" x 16" flasks. Photo No. 4, cast resin match plate for 16" x 16" flask. Drag side shown. Plates used on jolt to squeeze production molding machines. Photos by courtesy of Superior Steel & Malleable Castings Company, Benton Harbor, Michigan.







unusually small clearance between the spindle and its boxes.

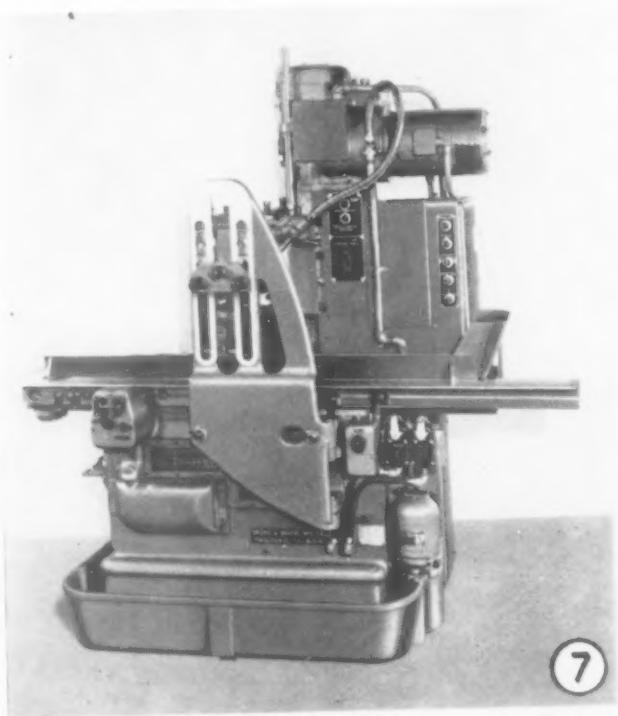
This construction practically eliminates spindle play, and adjustment is quickly and positively affected while the spindle is running. Other up-to-date advantages include time saving knob controls, individual motor drives, cross feed mechanism with adjustment to .0001" on diameter, and automatic oiling.

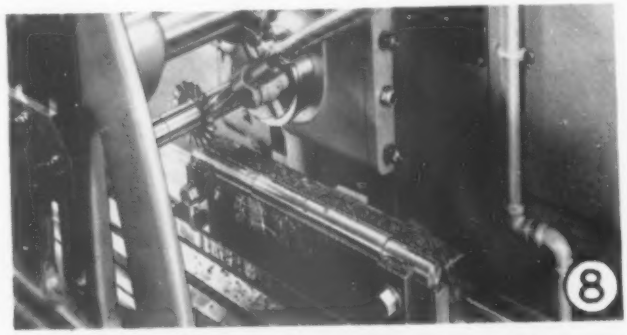
The stickler-for-code might say that these machines—that is, the No. 12 miller and the Nos. 10 and 12 grinders—are not strictly new; that they are essentially "face lifting" jobs. It is true that they are redesigns, but the redesigns are based on principles that have been proven sound over a period of many years. To all practical purposes, then, both machines are not only entirely new, but embody essential features and advantages demanded by fast-moving, modern industry. They are typical of the constant improvement and refinement being carried on by a progressive machine tool industry.

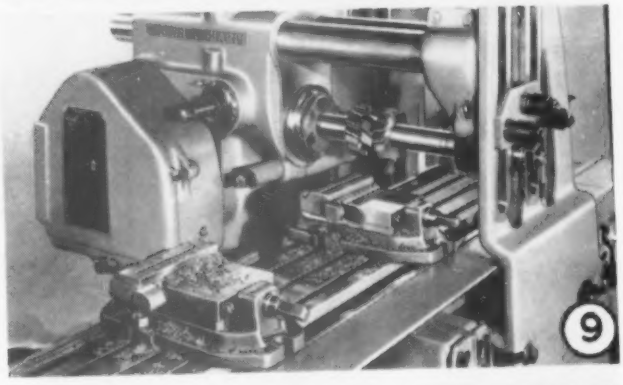
New Honing Machines

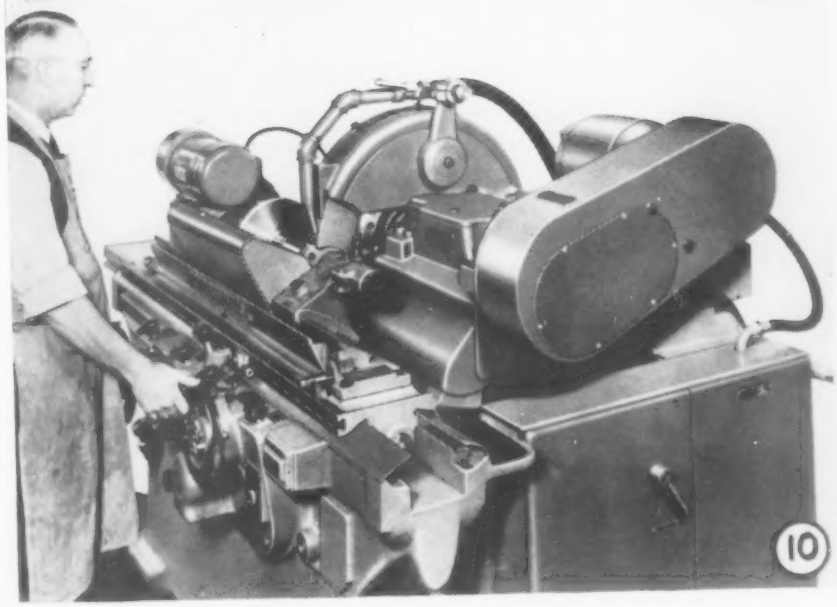
A new line of precision honing machines, by the Micromatic Hone Corporation, Detroit, is designed to meet a growing demand for finishing equipment that will remove more and more stock in less time from harder materials the while it holds closer tolerances. These machines are heavy duty, multiple spindle, unit construction, hydraulically operated jobs called Hydrohoners.

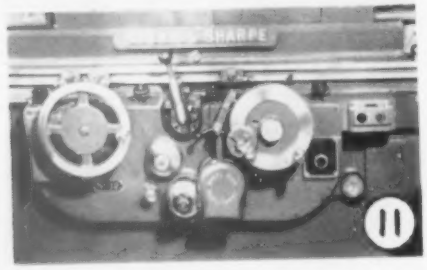
Photo No. 7 shows the new No. 12 Plain Milling Machine, by the Brown & Sharpe Mfg. Company, and Photo 8 the machine set up for a typical keyway milling job, the spindle head raising and lowering to suit the several diameters of the shaft. Photo 9 shows a setup for continuous cycle milling in which the spindle head raises to "jump" work which has just been loaded in one of the fixtures. Photo No. 10 shows the Brown & Sharpe Nos. 10 and 12 Plain Grinding Machines, now available with 10" swing to clear larger diameters and projections. Photo No. 11 shows the hydraulic and electrical controls, all operated by means of the cross feed hand wheel and the table start-stop knob. Spindle construction is shown in Photo No. 12.

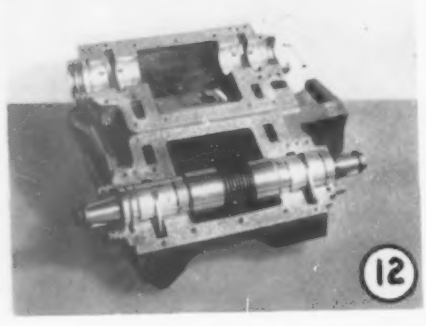








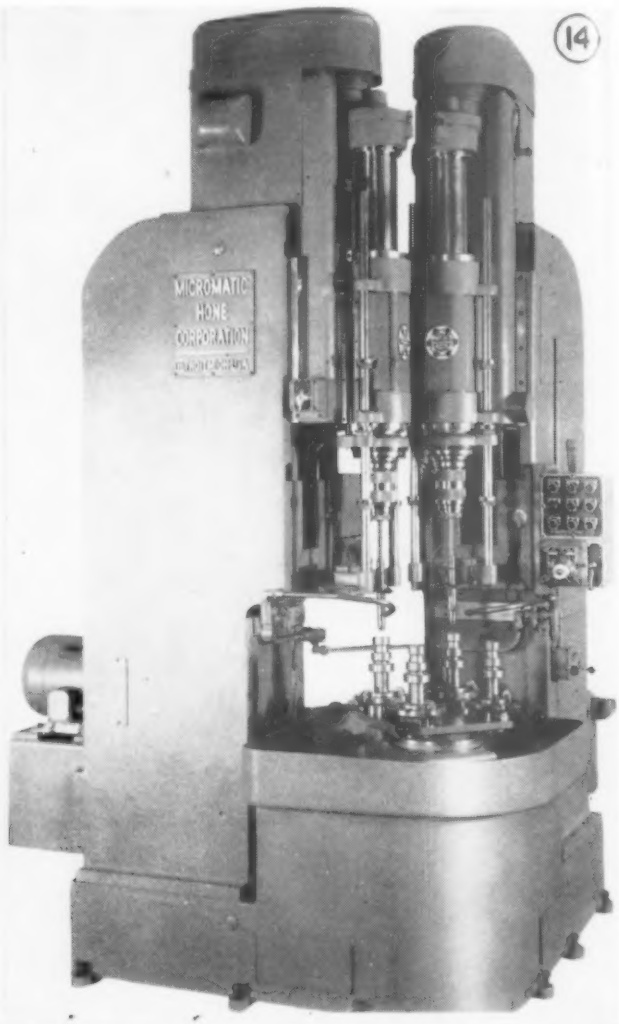


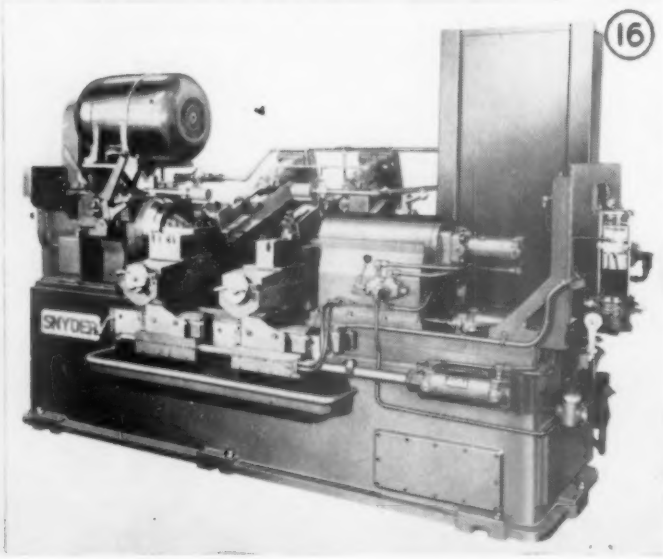


Microhoning, as it is called by Micromatic Hone, is essentially a stock removing process by which, as the stock is removed, the geometry (straightness and roundness), size and finish may be held to close tolerances. As the hardness of the material goes up, and the stock removal increases, the power requirements also increase; therefore, as the allowed tolerances are reduced, the adjustments and controls must be correspondingly finer and more positive.

This added power and control is provided by the multi-spindle, unit constructed, quill-type machines shown. The

Photo 13, the Hydrohoner, by the Micromatic Hone Corporation, fixtured to hone the cone bore of bearing races. Ten bearing races are stacked on a shuttle and honed in progressive steps. Photo 14, a Microhoner, tooled to hone cluster gears 9" long, performing the same operation in two gears simultaneously. Photo 15 shows a "special" by the Snyder Tool and Engineering Company, for rapid assembly of brake pistons and washers, and Photo 16 a new high production automatic lathe, also by Snyder, tooled to turn and face automotive axle shaft at high output.





indles are mounted in quills, each of which is actuated as independent unit, and this type of design is used to duce the weight reciprocated to a near irreducible minimum d to eliminate the need of guide bars. Torque and thrust e taken along the center line of the spindle.

The quills are mounted on separate columns, spaced about common base and indexing table. By interlocking the ydraulic control panels, the automatic indexing table, and he automatic sizing devices, the entire operation is made ntirely automatic. Thus, the expansion of the tools and he reciprocation of the quills are powered and controlled ydraulically. Feed-out is positive and the pressure applied n each tool may be adjusted independently.

The Hydrohoner machine shown in photo No. 13 is fixtured to microhone the cone bore of bearing races. Ten races, having a hardness of 60-62 Rockwell "C" and with stock to be removed varying from .008" to .012" on the diameter, are stacked in a shuttle. They are honed in three progressive steps, this not only making the operation very productive but also making it possible to vary the abrasives, feed and speeds to match the condition of the bore as the operation progresses.

The first spindle removes the out-of-roundness and makes all the races the same size. (A hard stick is required to withstand the severe dressing action encountered in this station). The second spindle removes additional stock, and here, a softer and more free cutting abrasive is used to remove stock rapidly and without heat. The last spindle generates the final size and finish, the abrasive and pressure used depending on the finish desired. This machine is said to produce more than 500 pieces per hour, with less than .0003" variation in size and less than .0005" out-of-roundness or taper in any one part.

Photo No. 14 shows a Hydrohoner fixtured to hone cluster gears, 9" long and having a hardness of 58-60 Rockwell "C". This machine performs the same operation on two parts simultaneously, with a stock removal of from .003" to .005". The production rate is said to be 200 parts per hour or more.

"Specials" to the Fore

In the line of "specials", Snyder Tool and Engineering Company, Detroit, has produced an automatic to assemble brake pistons and washers, shown in photo No. 15. This special-purpose automatic cycle machine employs a continuously revolving, variable speed table, which is driven through a spur gear and worm gear transmission with a 2 HP motor. Rotation speed can be easily changed by means of pick-off change gears.

Two operators are stationed at opposite sides of the table to load the brake pistons into the twenty automatically operated collet fixtures, mounted on the table, and to place packing washers in front of each piston. The collets close automatically, as the table revolves, and clamp the pistons. A spreader finger then forces the washer into place on the piston.

On leaving the spreader finger, the collets open and the assembly is ejected into a discharge chute, the entire operation occurring simultaneously at points 180 degrees apart around the table. The automatic work cycle is timed to complete 50 assemblies a minute, using unskilled labor and assuring dependable production on an operation difficult to control when manually operated fixtures were used.

Another special, by Snyder, is an automatic feed lathe designed with the primary objective of increasing production in turning operations by taking advantage of the latest developments in carbide cutting tools. The heavy and rigid construction of the machine permits high speeds and feeds to be maintained with unusually long tool life.

While this machine is designed and tooled for turning and facing automotive rear axle shafts, finishing all diameters and faces to size (except for grinding stock on the bearing and oil seal diameters) in one operation, at an output of 70 to 80 pieces per hour, it is an "interchangeable" in that it can be modified to suit seasonal model changes.

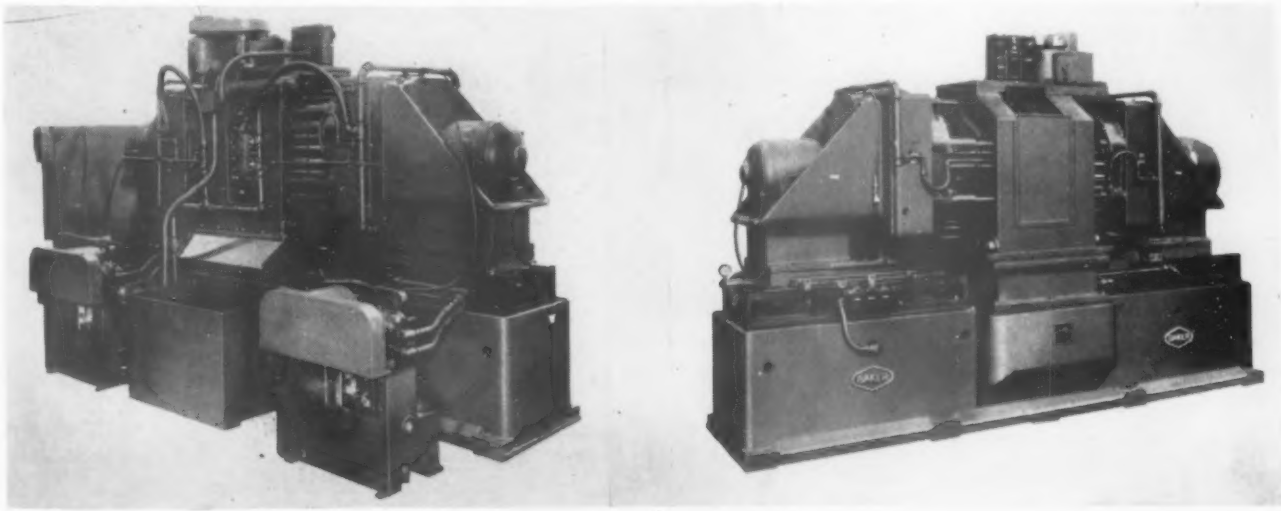
A center drive unit, and an overhead facing slide, can be added if desired; as designed, however, hydraulic feeds and wide adjustments on all slides permit a considerable range of parts to be machined with changeover time held to a minimum. The machine is equipped with two turning carriages, two facing slides and a hydraulically operated quill type tailstock. All feeds are hydraulic and readily adjustable by dials for each attachment.

New Tools by Baker

Especially designed for high production manufacture of automotive connecting rods and caps, a new two-way horizontal machine, by Baker Brothers, Inc., Toledo, Ohio, incorporates two 15 × 16 Baker hydraulic feed saddle units to drive the multiple spindles. The right hand unit is equipped with a 20-spindle fixed center multiple head, assembled with a self-contained lubricant pump and driven by a 10-HP motor. The left unit drives a 12-spindle head powered by a 7½-HP motor.

The saddles of these units are provided with hardened steel replaceable flat ways, allowing 16" travel of saddle.

At left, front view of Baker 2-way Horizontal Machine utilizing two 15 x 16 units. The back of the machine is shown at right.



Positive depth stop and delayed reverse attachment can be included if so desired. However, the units have a high rate of rapid traverse and saddle feed and—of especial interest in the event of model changes—may be mounted in vertical or angular planes as well as horizontal.

Of special floor type construction, the machine is designed with a 6-station trunnion type power index fixture arranged to clamp one connecting rod and cap at each station; thus, loading and unloading is greatly facilitated, resulting in high output.

Hydraulic power is provided for each of the saddle units by a completely separate variable delivery portable pump-sump unit mounted on casters. The latter mountings, together with self-sealing connectors, permit breaking the line without loss of hydraulic fluid or influx of air into the hydraulic system. That is, the power units are readily interchangeable, a matter of considerable import in reduced downtime when servicing. They are also "salvable" to suit seasonal model changes.

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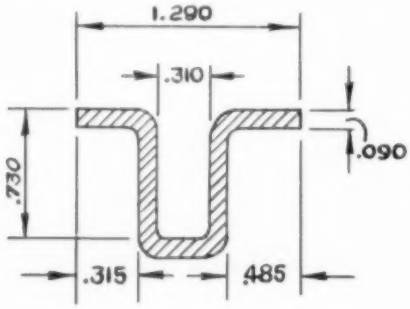
by Federico Strasser

Combination Die to Bend and Cut Wire

Our friends in South America solve production problems

REQUIRED, a piece of copper wire, formed as in Fig. 1, for a new product. The two arms had to be made .315" and .485", respectively, with the overall length over the end points 1.290". Tolerances were to be held ± .002". See Fig. 1. Finding it impossible to obtain the required accuracy with a forming die of conventional design, due to behavior of the material, we designed a simple combination die such as shown in Figs. 2, 3, 4 and 5. With this tool, we form and cut the wire in one operation and within the prescribed tolerances.

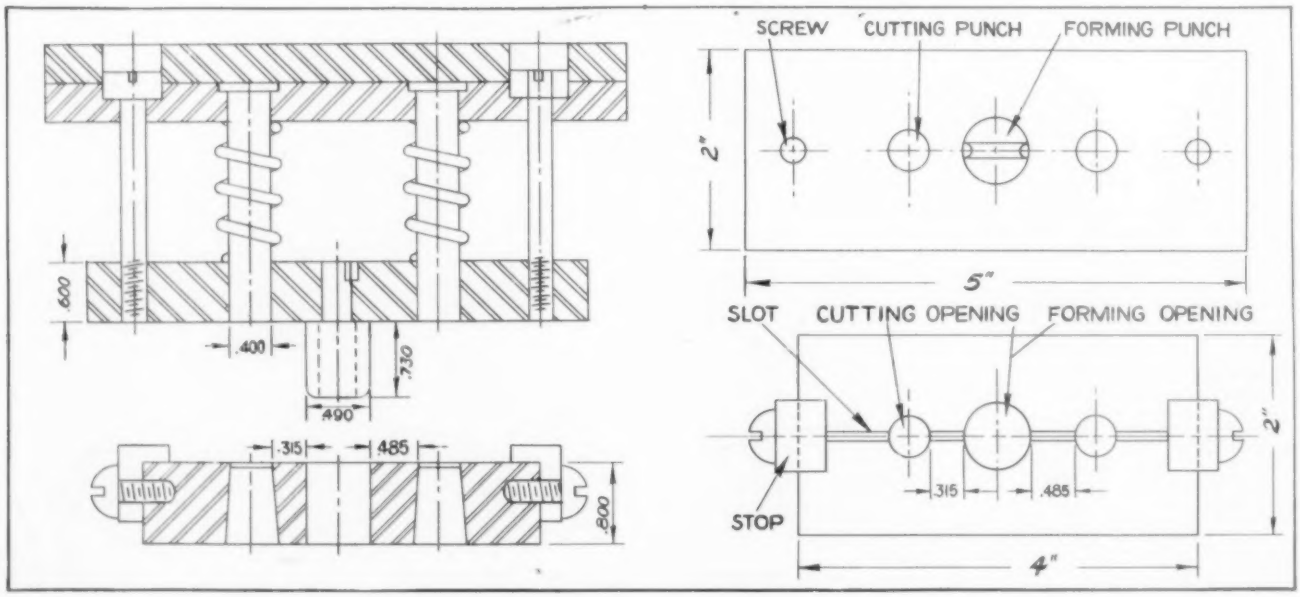


At left, the wire as formed in the die shown below. Drawing is schematic; at top right, the stripper, at lower right, the die in plan view.

The die has a slot (Fig. 3) and two end stops. The wire, pre-cut about 13/64 longer than the overall finished length, is placed in the slot and centered between the stops. As the ram of the press descends, the forming punch shapes the U; then, the two cutting punches follow and cut the part to exact length. There is, of course, a slight arc due to the fact that the cutting punches are round; however, the punches were made rather large so as to minimize this condition. Actually, the slight radius is unnoticed due to the small diameter of the wire—.090".

Frederico Strasser **is a partner of Mankewitz y Strasser Ltda, manufacturers of electrical and plastics products, Santiago de Chile, S. A. Born in Hungary, he studied engineering (with practical training) in Italy and Germany, and for a time was instructor in machine shop practice.**

The die is further provided with an ejector, not shown in the drawing, and the entire tool was mounted in a conventional die set. As designed as set up, however, the parts were made to required limits of tolerance and at a highly satisfactory rate of production.



by **Arthur P. Schulze**

34-19400

Roto-Finish Spurs Finishing Economies

A Recently Developed Technique Provides Qualitative Finishing on a Qualitative Basis

DESIGNED FOR USE prior to electroplating operations, Roto-Finishing—a recently developed metal-surfacing method—breaks the big bottleneck and high operating cost presented by two common production jobs: (1) hand finishing great quantities of parts with polishing and buffing wheels, and (2) the removal of burrs with files, scrapers, flexible shaft grinders, and wire brush wheels. Because of savings effected over ordinary tumbling routines, during the past few years, this highly improved barrelling technique for preplating now commands a significant place in the industrial finishing sun.

Production performance data already accumulated indicates that the method provides a key apparently destined to unlock promising new vistas of application in grinding or deburring, polishing, "britehoning",* and coloring of parts incidental to final decorative finishing or protective coating operations. As one major manufacturer of domestic appliances put it:

"The process opens up a new field in industry, and furnishes an opportunity for the manufacturer to turn out a satisfactory finish at a fraction of the cost involved in hand labor."

A Versatile Technique

Indicative of the manufacturing economies and other processing advantages now resulting from the Roto-Finish method are the following few case studies, culled and condensed from current production experience. They are typical of the performance reports coming from other plants scattered across the nation.

The Die Casting Division of the Electric Auto-Lite Co., Woodstock, Illinois, daily produces die castings approximating 70 tons. In replacing hand deburring and "hand-held" polishing and buffing routines, and the tedious, time-consuming work they often involve, this process is said to effect an average saving in cost of 50%. Furthermore, the finish secured on parts proves equal, and in many cases superior, to that formerly obtained.

The King-Seeley Corp., Ann Arbor, Michigan, makes automotive parts and plumbing hardware among other products. With Roto-Finish units on the production line, prefinishing of small die castings and small stampings is handled on a volume basis at high speed with relative ease. Handling six machines simultaneously, one operator deburrs 2400 pieces per hour on the average.

While automatic buffing machines are used for finishing those items whose shape and size permit, the Roto-Finish process presently accounts for the greater percentage of mechanical finishing production in this plant. Thus, with two good methods available at an instant command, this plant processes a preplating preparation setup that is fast, economical and efficient.

As further illustrating the versatility of Roto-Finish may be cited General Electric's experience. In its new plant at Trenton, New Jersey, the company reportedly operates one of the latest and largest Roto-Finish installations in the country, employing the method for prefinishing automatic washing machine parts of diverse size and shape as well as of greatly varied composition.

Average time for processing grey iron sand castings is from 1 to 2 hours; aluminum die castings, 2½ hours; steel stampings, 1½ to 3 hours; brass stampings and brass screw machine products, 1½ to 2 hours. Other components Roto-Finished include steel forgings and screw machine bronze work. Highly skeptical at first, G-E production officials are reportedly so well satisfied with results obtained in deburring and rounding of sharp edges by this method that they are seriously considering extending application to britehoning other parts which are presently prefinished by wheel polishing and buffing.

Still another plant, where the method comprises an essential production-line operation, is The International Business Machines Corp., Endicott, New York, where over 8000 different parts are processed currently with this method. The number is constantly increasing, according to the plant superintendent.

From these and similar reports of production performance by hard-headed production executives, it becomes apparent that this advanced technique does *four* definite jobs from the results standpoint. It saves time, provides uniformity, cuts costs, and conserves manhours. Savings such as these are always of interest, of course, but they assume added significance to all metalworking executives responsible for production finishing in these days when material and labor costs continue to rise.

First, consider time-saving. Parts can be deburred and finished, on a mass-production basis, in a single operation and in a fraction of the time involved with tedious manual methods. By staggering work schedules a single operator can load and unload a battery of machines.

Repetitive uniformity is a second outstanding advantage from the standpoint of processing. This result is achieved because the technique is accurate, supplying the same degree of finish on parts of one run or many. Standards can be set up and maintained to secure the same required finish on every piece. The process, through its controlled action, may be precisely regulated over a wide range—from severe cutting to fine finishing—so that it is entirely practical to maintain exacting specifications without loss of blueprint tolerance.

Details of Operation

Last, but by no means least, by eliminating all tedious hand-finishing operations, this mechanical method makes it possible to process huge quantities of parts in far less time than is the case with single-piece hand work by skilled operators. Since one man takes the place of many, skilled personnel can be shifted to other important production tasks.

Having reviewed the advantages of Roto-Finishing, let us take a quick look at various details of its operation. Then, our picture of this prefinishing process will be fairly complete. Resembling somewhat the far older method of tumbling, this patented barrel-finishing process is a recent

*A trade name

development of The Sturgis Products Co., of Sturgis, Michigan. The unusual versatility of this technique is highlighted by the fact that the method makes possible four basic types of mechanical finishing. They are:

1. Grinding for deburring with grinding chips and compounds.
2. Polishing with britehoning chips and the same compositions as used in grinding for deburring.
3. Britehoning with a special honing compound, an operation used in sequence with Finishing Process No. 1 as a two-step procedure.
4. Wet coloring parts following their preparation by any of the preceding processes. Steel balls of various sizes (or suitable coloring media) are used.

The process thus consists essentially of using specified wet mixtures of chips and compounds in a controlled rotary action to remove burrs, sharp corners, and rough edges on small stampings, forgings, machined parts, extrusions, and die castings. It prefinishes and prepares for plating both ferrous and non-ferrous parts from simple stampings weighing but a fraction of an ounce up to intricate castings weighing as much as 75 pounds. Parts of almost every shape and description, with plane and compound surfaces, are finished with equal effectiveness.

Made in six different models, each of a different size, the standard machines used are readily adaptable to handling special jobs within these four main classes of processing merely through the substitution of the appropriate chips and compound as recommended by Sturgis technicians. Following is an outline of each mechanical method of prefinishing as adapted from the fundamental technique.

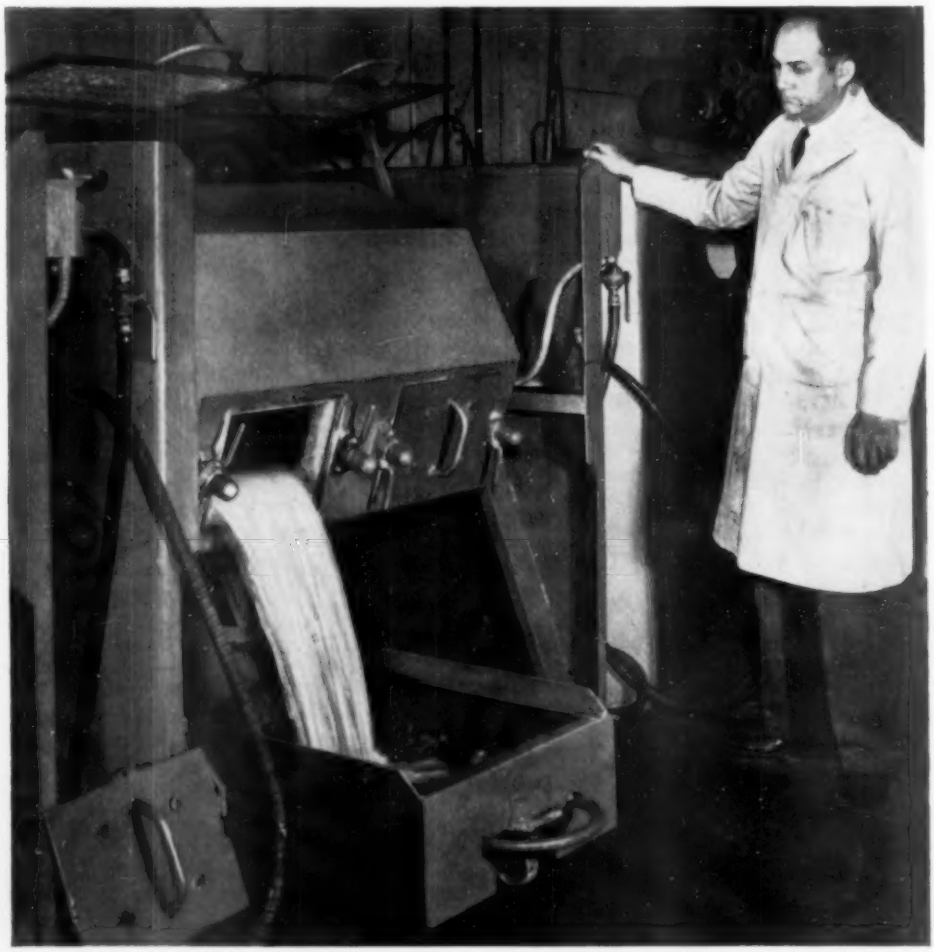
Grinding for Deburring

The process consists of six simple steps. These are: (1) loading a horizontal, octagon-shaped, wood-lined metal cylinder, either single or multiple compartment type, with metal chips as specified; (2) placing required quantity of pieces to be finished in same compartment; (3) adding abrasive material and water to the load as recommended; (4) rotating the barrel or cylinder slowly for a predetermined period, which varies over a considerable range; (5) pressure-rinsing parts with clear water after rotation cycle is completed; and (6) screening the finished parts from the chips.

Rotation rate of the ball-bearing-mounted, electrically driven cylinder varies in accordance with the type, size and shape of part in process and degree of finishing desired. Operating the machine at too fast a rate separates the parts from the mass of chips, with the result that impingement may mar the pieces. Too slow a speed, on the other hand, prolongs finishing time unduly. Processing cycles range in time from 1/6 to 8 hours, as required for aluminum stampings and die castings, to 5 to 24 hours on ferrous castings and forgings.

Because of this time range, each individual proposed application for Roto-Finish must be exactingly analyzed with particular attention being focused on such factors as hardness, size and shape of part to be processed; degree of deburring desired; speed of cylinder; and size of chip used. Present production practice shows that parts, simple in shape, are finished far faster than pieces having intricate contour. For that reason, the manufacturer maintains a processing department completely equipped with facilities to study each individual job.

Unloading parts which have been processed by the Roto-Finish technique in equipment specially designed for mechanical prefinishing by this method.



Carefully presized and prepared exclusively for finishing by this mechanical method, the grinding chips used determine the quality of finish. Altogether, there are 17 different sizes of grinding chips supplied by the manufacturer. Sizes range from $1\frac{3}{4}''$, in longest dimension, down to $\frac{1}{16}''$.

Size of parts and dimensions of holes or recesses form the basis of chip size selection. Chips must be used that will turn out the desired finish, yet do not lodge in the openings of parts being processed. The general rule is that the larger chips produce a rougher finish and perform a quicker cutting job, while the smaller chips provide a finer, smoother surface finish but with slower cutting action.

Use of compounds, together with chips and water, constitutes an essential requirement of wet grinding and deburring by the Roto-Finish Process. Specially prepared powdered compounds which vary in alkalinity and abrasive content, these compositions not only impart sufficient lubricity to chips and parts in process, but also keep work from tarnishing, etching, or rusting.

These compounds serve still other notable functions. One is their contribution toward cleanliness of the finishing compartment. Another is preventing chips from becoming glazed or loaded with metallic particles removed by the chips from work being deburred or finished. A third purpose, served by the compounds, is that they correct water deficiencies whenever this condition becomes a factor for consideration.

Polishing

Roto-Finish polishing is virtually the same as grinding and deburring by this improved technique, but there is this basic difference:—it involves a "softer" action and requires the use of special "britehoning chips" which are less abrasive than the grinding chips. The action is slower; however, the finish produced is smoother than that turned out by the chips employed for deburring.

Prepared, processed, and screened in much the same manner as the grinding chips, these britehoning chips are available in the same sizes as the grinding chips. The rate of efficiency-depreciation runs slightly higher in polishing than in grinding, amounting to approximately 5% for 24 hours' operation with britehoning chips as against 1% over the same operating period for grinding chips of the same size.

In polishing, as with grinding and deburring, the processing cycle time must be determined in all instances. It ranges from 6 to 12 hours in average plant practice; however, when polishing follows a grinding operation, the cycle takes only 4 to 8 hours. The same compounds utilized in grinding and deburring are also employed in polishing.

Britehoning

The latest developed refinement of the Roto-Finish Process, Britehoning is a combined polishing-honing operation, of which the honing cycle is the second and concluding stage of a two-step procedure. It follows the initial polishing operation reviewed above.

Through the use of suitable compounds and fewer abrasive chips than applied for deburring—in a specified formula devised by Sturgis engineers—small parts are tumbled to yield a fine, semi-lustrous finish on both ferrous and nonferrous work. Polished pieces, together with the chips, are thoroughly rinsed in the compartment. Then, in order that the chips will act as honing agents rather than as a polishing medium, a special wet honing composition is added to the mass. Honing time ranges from 2 to 3 hours, with most of the brightening action transpiring within the first hour, then tapering off.

The process proves adaptable to many different types of parts as a preplating operation, and its use is already extensive for mechanically finishing an assortment of items before electroplating, anodizing, or painting. Among these products are automotive parts; building, plumbing and general hardware; household appliance components; fishing tackle; sporting goods; tools; and business machines. Parts can be britehoned directly after forming or trimming operations if there are no deeply penetrating die and stretcher marks present. Die castings, too, may be directly processed when parts are closely trimmed.

Wet Coloring

Application of this type mechanical surface treatment, also developing swiftly throughout the metalworking industries, is recommended for use on parts that have been processed by any preceding Roto-Finish or combination procedure. The mass in this particular instance consists not of chips, but of steel balls or highly polished coloring media.

The mass-work-load ratio depends upon the size of the compartment, while size of balls used is governed by the size and hardness of the part to be colored. Three special types of compounds have been developed to meet individual

Ten parts which have been finished by the Roto-Finish Britehoning Process. The group illustrated consists of: (1 and 2) zinc die castings; (3) steel stamping; (4 and 5) brass stamping; (6, 7 and 8) zinc castings; (9) steel stamping; and (10) brass stamping.

processing requirements. One is a mixture of water-soluble materials with high alkalinity that helps to produce a high luster on iron, steel, stainless steel, and nickel alloy parts only. It also may be employed, with chips, to remove scale deposits from heat-treated steel parts which are not excessively scaled.

The second compound is designed for turning out a high luster on brass and copper alloys as well as on aluminum parts. In addition, some plants are using this material to wet-color copper, brass and silver-plated parts where luster or color is desired. However, it is not used with britehoning chips due to adverse chemical reaction.

Newest wet coloring compound, developed by the Sturgis laboratory, is a mildly alkaline blend of chemicals used with steel balls, or other highly processed polishing media, to color copper and its alloys, such as brass and bronze. Good results are also being obtained, with it, in coloring aluminum and zinc alloys. This material, moreover, may be used with grinding chips for producing a bright finish together with normal deburring on parts which cannot be britehoned or wet colored economically. Where development of a high luster is desired, parts to be wet colored must be cleaned, descaled, and deburred, or otherwise treated to remove surface defects. In most cases, it has been found advisable to britehone the work before wet coloring.

As we have seen, the four basic techniques of Roto-Finish are all founded on the principle of "wet processing," which involves the use of various mixtures of chips, compound, and water in specific ratios following determination of the operational variables of size, shape, and kind of parts to be treated along with type and degree of finish desired. Having covered "wet processing," the story would remain incomplete without mentioning, at least briefly, that a Roto-Finish "dry processing" practice, employing differently designed equipment, also has been developed by Sturgis engineers. While admittedly slower and more expensive than the methods described, dry processing has nevertheless proved to be more practical for finishing certain parts that are too fragile to process by wet routines. Suitable for processing zinc and brass castings as well as light gage stampings before electroplating, it imparts a fine, bright finish to the work as it smooths surfaces and edges.

by **Robert Mawson**

34—7311

Drill Fixture for Machine Tool Headstock

An ingeniously designed tool for small-lot production of precision parts

COMPONENT PARTS OF MACHINE TOOLS must be accurate, for smooth functioning of the assembled machine, and interchangeable to provide for future replacement. Jigs, fixtures and cutting tools must therefore be designed to meet these requirements. A typical example is the fixture, illustrated here, for drilling the headstock of one of several types of grinders manufactured by the Abrasive Machine Tool Company, East Providence, R.I.

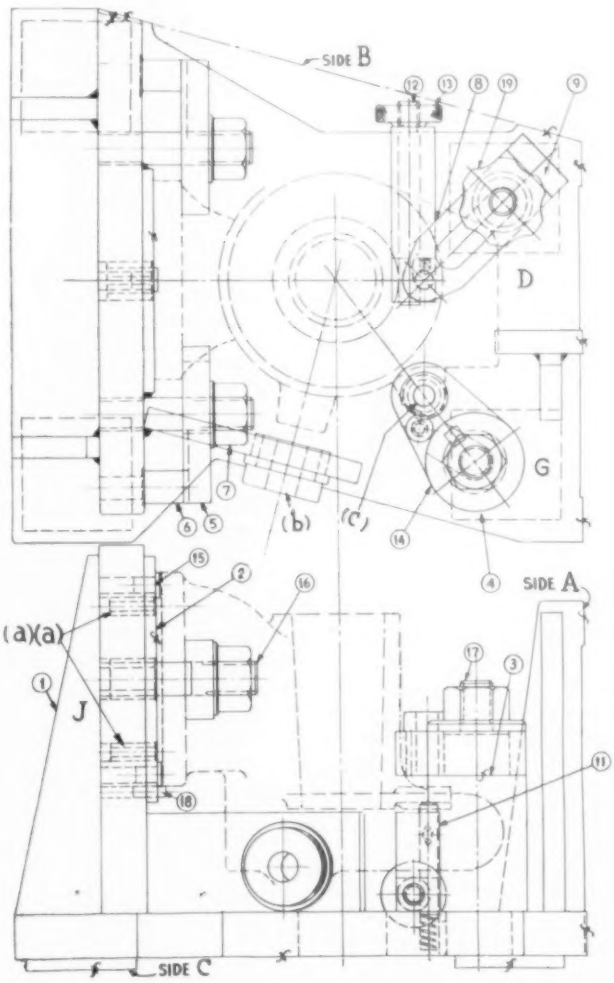
The work done in this fixture, which is designed for small lot production, consists of drilling two No. 7 holes (a) (a) for subsequent tapping to ¼"-20; drill angular hole (b) in the following order: drill 45/64 and ream 23/32, c'drill 13/16 to depth of ⅝ and tap ⅞-14; and drill hole (c) 31/64 and ream ½". Holes (a) (a) are drilled with side "A" down; hole (b) with side "B" down, and hole (c) with side "C" down. Holes (a) (a) are drilled through pressed-in bushings, and holes (b) and (c) through slip bushings.

The part (shown in heavy dot-and-dash outline) is located centrally by a key-slot nesting on combination locating and rest buttons, and vertically by a stop pin, while a spring jack compensates for any variation between the rough casting and a finished surface. Clamping is at three points.

The fixture is made of steel plates, oxy-cut to shape and joined by welding. The body (designated as Det. 1) is machined on sides "A", "B" and "C"; on rest pad (2) for location of part; on boss (3) and for location of bushing plate (4). All machined surfaces are designated by finish symbols £, except seats for bushings and rest buttons, which are spot faced.

The three clamps are retractable. Clamps (5) rest on shouldered pins (6) and are held down by hex nuts (7). Clamp (8) rests on pad (9) and is held down by hand knob (10). Pressure of clamp (8) is against the spring-jack (11), which is locked by means of lock pin (12) and nut (13). Other details include the bushing plate (14), which is keyed in angular position; the combination locating and rest buttons (15), which are hardened and ground; studs (16) and (17); and stop pin (18). These, with miscellaneous washers and screws, complete the assembly.

Taken as a whole, the fixture is simple in design and construction, provides positive location to insure interchangeability, is easy to load and unload, and equally easy to handle. Construction, of course, is so obvious that detailed explanation is hardly necessary; as designed, however, the tool is ideally suited to its purpose.



World's Fastest Strip Mill Controlled by Electric "Brain"

WHAT IS SAID to be the world's fastest cold-strip steel mill is at the Aliquippa Works of the Jones & Laughlin Steel Corporation, of Pittsburgh. This mill, designed and built by the Mesta Machine Company, features the heaviest construction of any tandem cold-strip mill for tin-plate gages to be found in the world.

Control of this strip mill is by means of an electric "brain" and an X-ray measuring gage, both part of General Electric Company's control equipment. This control system, according to G-E engineers, makes it possible to operate the mill at a speed of 70 miles per hour; thus 5-mile long coils are rolled through the machines in less than five minutes.

The "brain" of the system is an amplidyne, made famous during the war when used to control gunnery systems of battleships and B-29s. It is a generator of unique design, now used in the strip mill as an accurate measuring and control device. It instantly detects and corrects irregularities in operation and makes it possible for the mill to accelerate from a threading speed of 300 feet per minute to more than 4500 feet in six seconds. It also permits the speed of the machinery to be reduced from the 70 mph speed to a standstill in the same period of time.

When set to measure the thickness of the steel strip as it leaves the mill, the X-ray gage bombards the thin metal with a beam of X-rays without physically contacting the steel in any way. Simultaneously, a second beam of X-rays continuously penetrates a standard reference sample of steel of the same thickness. The two beams are compared by a radiation detector and, if the intensities are the same, the rolled steel is of the desired thickness.

by **M. S. Gjesdahl**

Education and the Tool Engineer

College curricula should not be streamlined to the confines of a narrow field.

WHAT IS TOOL ENGINEERING? What is a Tool Engineer? Shortly after becoming a member of the ASTE, this last question was asked of an officer of the Society. No concise definite statement seemed to be formulated then which in one brief sentence would identify tool engineering or a tool engineer. It would be stimulating and probably enlightening if a contest were initiated among the members to obtain the most acceptable definition of Tool Engineering and a Tool Engineer.

With the thought in mind that young men may be encouraged to enter the tool engineering field, after completion of a formal mechanical engineering education, it seems desirable that the scope of this branch of engineering be clarified. From a study of men designated as Tool Engineers it would seem that their place in engineering is to design and/or select the machines, methods or tools with which materials of manufactured parts shall be shaped. This statement is offered with the thought that it may open the subject for further discussion.

***Maurice Sven Gjesdahl*, Professor of Mechanical Engineering at the Pennsylvania State College, School of Engineering, served as research engineer with the Landis Tool Company, Waynesboro, Pa., during the war years. A member of Central Pennsylvania Chapter, he is well known in ASTE circles for his interest in tool engineering and talks on centerless grinding.**

The definition of Tool Engineering, as stated by Past-President Otto W. Winter, has been given several times in *The Tool Engineer* and is repeated for comparison with the above suggestion. Winter says: "Tool Engineering is the art and science of analyzing, planning, designing, constructing, and applying the means and equipment for the mechanical production and manufacturing of industrial and consumer goods and commodities." As Prof. Boston stated in his article "Research in Tool Engineering," in the June 1946 issue of *The Tool Engineer:* "This obviously includes a very wide field of activities on the part of the tool engineer."

Turning back the pages of history we find the first form of engineering was military engineering. The men recognized as military engineers were specialists in military problems. The laws of nature became more and more known and men became specialists in the construction of buildings, viaducts and roads. These men were called civil engineers. By and by engineers were called upon to specialize in the manufacture of implements for military, construction and agricultural purposes, and these engineers became known as mechanical engineers.

For a long period of time—well over a thousand years—there existed these two main branches of engineering, both originating from military engineering. Late in the 19th century, men who were specialists in the field of electricity were called electrical engineers; also, mining became a major industry and mining engineers were specifically trained.

At the present time engineering has been so subdivided that specialists in each type of industry may be and are designated as engineers of their specific field. Today there are abrasive, acoustical, aeronautical, agricultural, air conditioning, automotive, bearing, chemical, control, design, electrical, electronic, gas, heat power, industrial, instrument, illumination, locomotive, lubrication, marine, methods, milling, metallurgical, plastics, power, production, process, statistical, radio, railroad, refrigeration, sales, service, steam, telephone, tool, transmission, transportation and turbine engineers, to name a few which may be said to be subdivisions of mechanical engineering to a greater or lesser degree. Generally speaking, from the educational point of view, it is evident that collegiate curricula cannot and should not be streamlined to the confines of a narrow field.

Broader Training Needed

It has been demonstrated in the past, and there is evidence at present, that graduates with a degree in a subdivision of mechanical engineering are seeking opportunities outside of their special training. Too late do they realize the shortcomings of specializing in the four year under-graduate academic training. Some under-graduates observe that men with general training are in greater demand in a wide variety of industries.

To many companies employing graduate engineers, it makes little difference what the particular curriculum was in school—the men are designated purely as "engineers." The student with a broad training should be prepared and qualified upon graduation to step into a large variety of positions. His progress in industrial training will depend greatly upon an ability to use the fundamentals of engineering, which is what a broad academic curriculum offers and what the alert student acquires.

"The way to educate an engineer is with one general course and one degree." So says Dr. Harvey N. Davis, President of Stevens Institute of Technology, who believes that the time for specializing in any one branch of engineering comes after the student has had a broad training in the fundamentals of all engineering.

Mr. K. B. McEachron, Jr. of the General Electric Co. in an article in the *Journal of Engineering Education*, October 1947, states that "the college is expected to give the student basic rather than specialized instruction, and specialized design courses will often give the student an erroneous impression of what he may expect in industry."

A gentleman well known to the members of the ASTE—Mr. B. P. Graves, Director of Design, Brown and Sharpe Mfg. Company—in an excellent article (November 1947 issue of the *Journal of Engineering Education*) entitled: "A Machine Tool Designer's Thoughts on Engineering Education," makes the following statements which are pertinent. Quoting Mr. Graves: " . . . men who know their mathematics, physics, mechanics, strength of materials, and the theory of structures so well that they have confidence in their knowledge and when faced with a new problem, will fall back on this basic knowledge and begin their analysis from there.

"In our industry there are hundreds of problems and fields of design which are not covered in college courses. No engi-

neering school has courses in milling cutter design and few students have heard about clearance, rake and spiral angle. We do not think you should give courses in milling cutter design, but how are you going to prepare the young engineer who must take up this work? The surest way of helping him is to ground him in fundamentals."

In the August 1945 issue of *Mechanical Engineering*, an article entitled "A Reply from Industry to the Colleges" appeared, written by M. M. Boring, A. R. Stevenson, and K. B. McEachron, all of the General Electric Company. One paragraph bearing on the subject is important and gives additional emphasis. This paragraph says: "Engineering education in college must be concerned with engineering fundamentals rather than specialized design. The war has shown us that radically new designs must usually be based on the fundamentals of engineering rather than on previous design.

Schooling in Fundamentals

"It is far more important, therefore, for the college graduate to have a thorough understanding of all the fundamentals underlying engineering rather than detailed knowledge of any specific design or device. For example, a thorough understanding of such fundamentals as Newton's laws is of far more value in the solution of general mechanics problems than a host of specialized formulas."

It should be pointed out that the majority of the large industries employing graduate engineers are putting the young men through a period of training to acquaint them with the products and methods of the company.

"The Engineering Profession," a volume by T. J. Hoover and J. C. L. Fish, defines an engineer thus: "An engineer is a person qualified by aptitude and education to solve engineering problems and to direct engineering activities."

The authors, elaborating on this definition, state that the work of an engineer is essentially mental rather than manual. Pertaining to education, they say: "More and more, it is to be expected that the first qualification of a professional engineer will be evidence that he has successfully pursued a systematic and adequate engineering training. With the rapid development of engineering, men lacking this training will be increasingly at a disadvantage in competing with those who have it."

In addition, Hoover and Fish define engineering in these words: "Engineering is the professional and systematic application of science to the efficient utilization of natural resources to produce wealth." The words used in this definition are comprehensive and general; however, this statement —and that of "an Engineer"—define the broad scope of the entire engineering profession.

The swarms of earnest young men who have crowded the educational institutions of the country are facing the future with a reality that "all that glitters is not gold." Those who returned to complete academic careers, broken by the claims of a nation at war, are going from their alma maters with high hopes that the investment made in the preparation for life's problems will yield dividends. There are many young students receiving an opportunity to "go to college" because a grateful nation believes the future is more secure with an intelligent, mentally alert manhood.

A Promising Future

The sincerity of the men just finishing their collegiate programs is outstanding. It may be that the time spent in the service of their country has given them a maturity and a sense of values not ordinarily found in a group of students of college age. They will make a definite contribution in the industrial and scientific world of tomorrow.

In the May 1946 issue of *The Tool Engineer*, Mr. Gra[illegible] S. Wilcox, Jr. writes: "Tool Engineering offers college m[illegible] the most promising future among all the engineering prof[illegible] sions." Some of the young college men graduating this ye[illegible] will undoubtedly find a place in the tool engineering fie[illegible] However, the careful scrutiny given to the great varie[illegible] of opportunities indicates a difference of opinion in t[illegible] "most promising future." The writer, having been with T[illegible] Landis Tool Company during the war period, can appreci[illegible] the statement that Mr. Wilcox makes. The opportuniti[illegible] are definitely present in the field of tool engineering an[illegible] the next few years will undoubtely show a tremendou[illegible] expansion.

At the Pennsylvania State College, courses are given in Jig and Tool Design, Mechanisms, Machine Design, Produc[illegible] tion Engineering, and Design of Machine Tools. The las[illegible] named is a new course offered as an elective in the senio[illegible] year for students interested in manufacturing and design[illegible] Less than one-fifth of a senior mechanical engineering clas[illegible] has indicated interest in the subject which competes with other electives such as Gas Turbines, Steam Turbines, Refrigeration and Air Conditioning, Heat Transfer and Power Plant Design.

Personal interest, future, job security and compensation bracket generally underlie the decision to enter a certain branch of engineering. Now, when mechanical engineers are in demand, young graduates carefully select the field or location which has the greatest appeal.

If the opportunities in tool engineering exceed that of any other phase of engineering, graduates will flock to the fold. If the companies employing young engineers in great numbers specifically want tool engineers, educational institutions the country over will appreciate the requirements for attention to special courses to satisfy the needs. Then, in due season, the standards and dignity of Tool Engineers, Tool Engineering and the ASTE will be enhanced by the accomplishments for the advancement of good for all mankind. Recognition as a basic engineering group would be assured.

This paper is closed as it opened, with "What is Tool Engineering? What is a Tool Engineer?"

Index---Continued

THE THIRD of an Index series, covering Vol. XVII, August 1946 to January 1947, will be found on pages 61 to 63, this number of *The Tool Engineer*. Each succeeding issue will carry an index for succeeding Volumes until all editorial matter back to February 1945 will have been included.

Exterior Masonry Paints

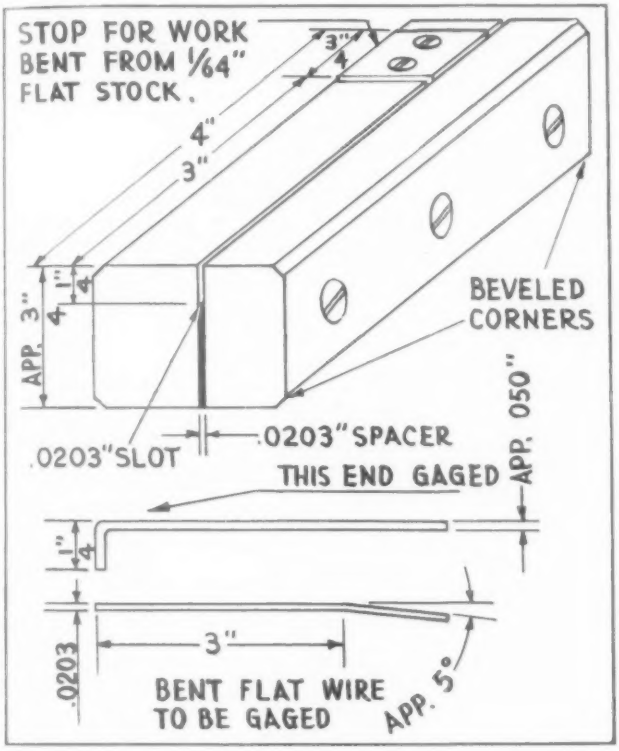
COMPLETE DATA on the relative durability and performance of four general classes of masonry paints have recently been published by the National Bureau of Standards as Building Materials and Structures Report 110—*Paints for Exterior Masonry Walls*. The booklet (BMS 110) is by C. Sentel and consists of six chapters totalling 19 large, 2-column pages, and is adequately illustrated with 15 halftones, one chart, and four tables. It is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 15 cents per copy.

The pamphlet gives information on water-repellent and decorative finishes, and is based on exposure tests, extending over a period of six years, of a number of commercial masonry paints. Ratings are given based on weathering characteristics and performance of each type of paint, and painting methods for coating different surfaces are evaluated.

GADGETS

Simple Gage for Wire

A GAGE, for measuring a small lot of specially formed wire, was required to have a slot ¼" deep and exactly .0203" wide. Because of the small order—about 1000 pieces—it was concluded that a soft gage, made of cold rolled steel, would suffice for the job and remain accurate for the duration of the run.



Cutting the slot looked easy, but, as we were unable to get a high speed steel saw, we had to use a carbon steel cutter—and it just didn't last. We then ground two sides parallel, put in a ground spacer the exact width of the required slot, screwed the three components together and there we had it—an accurate gage inexpensively made and "reworkable" to boot. A simple stop completed the job.

Edward Diskavitch,
Torrington, Conn.

Conveyor Life Doubled

MOST TOOL ENGINEERS are doubtless familiar with the method of lengthening the life of a conveyor belt by turning it through 180 degrees, or "end for end" as some people express it. The wear is equalized in that way, hence the life of the belt can be considerably prolonged.

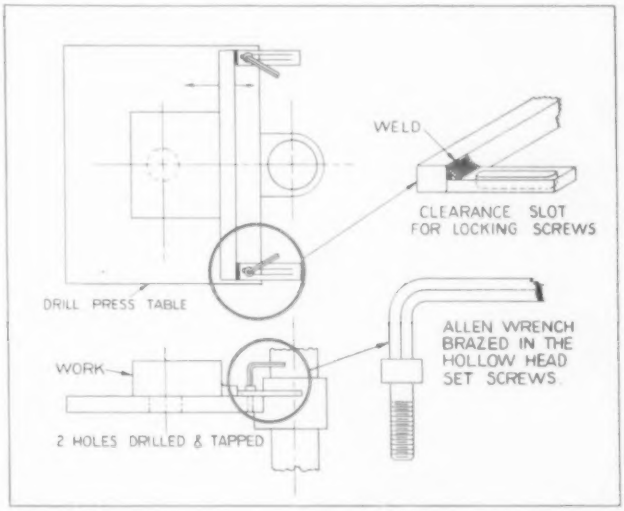
That gave one user an idea, as follows: This man operated a long conveyor belt and the wear was severe due to the nature of the material handled. Conditions in the plant were such that the belt had to be considerably wider for handling peak loads than was necessary for normal conditions. In fact, the peak—occuring less than 10 per cent of the operation time—was more than twice the load handled during normal operation.

So, with the above facts in mind, the operator—who was somewhat of a designer himself—arranged the installation in such a way that the lighter load was carried off center, and the point of impingement of the load while falling on the belt was distributed over one side from center to edge. As a result, most of the wear takes place on one side of the belt and, because of this fact, he can reverse the belt and really get more than double the wear as compared with carrying both loads in the middle of the belt and permitting the impingement to occur directly in the center at all times.

W. F. Schaphorst,
Newark, N. J.

Positioner-Stop For Drilling

AN EASILY MADE adjustable stop and positioner of welded construction, as shown in the drawing, can be applied to almost any standard drill press table. This fixture will prove a very satisfactory stop for holding any size or shape of workpiece not necessarily requiring hold-down clamps or bolts.



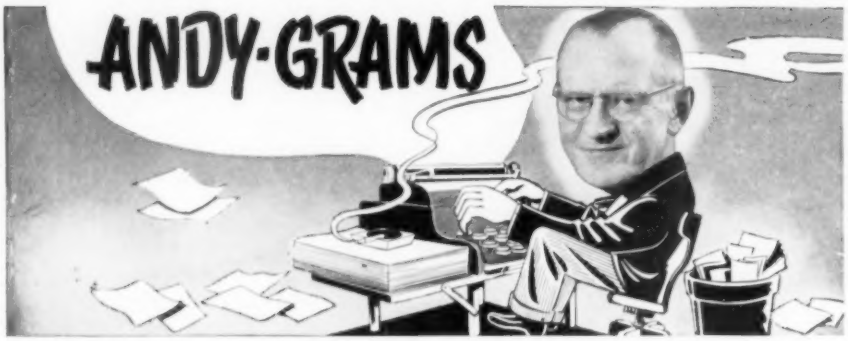
To use, the guide or stop bar is moved to suit the relation of edge of workpiece to center of spindle, and then clamped by means of the socket head cap screws with brazed-in keys. (Incidentally, these may be adapted to other clamping uses.)

In most cases, accidents caused by a piece being drilled suddenly starting to revolve—a rather common occurence when work is hurriedly drilled by careless or inexperienced operators—can be avoided by use of a fixture of this type.

Edmund L. Johnson,
Pittsburgh, Pa.

"Well Sweep" Balancer

A BALANCER for suspended tools—electric drills, hydraulic riveters and such—may be balanced by means of a pivoted bar having a sliding counterweight. The bar is suspended by a center hole, the tool by an end hole, and the weight is then slid along the bar to effect a nice balance.



As promised, and spurred by a last minute reminder by my hard working Sec'y, I went to Fond du Lac but, on invitation from Evinrude's Joe Ebener, stopped off to visit the Milwaukee ASTEers en route. While there, met past Director Art Johnson (long time no see), Foster Koehn, wheel horse on the Editorial Com'tee and K & T's Dr. A. O. Schmidt among others too numerous to mention, but not forgetting Gene Bouton with whom I renewed the debate plain vs. ball bearings and got nowhere as usual.

Heard George Sanborn of Fellows give his talk on gears which is hereby heartily recommended, then, after the show—which included swearing in the new officers by (now past) Ch'man Paul Butzin—Larry Rademacher took me around to a family movie which, in spots, evoked wolf whistles in which I couldn't join a/c I can't whistle besides which I don't know whether the accent comes on the penult or the antepenult. I just haven't been around.

At Fond du Lac, where the weather was chilly but the hospitality warm, I had the long-deferred pleasure of visiting the Giddings & Lewis plant and, after a while, felt so at home that when the paymaster came through I lined up with the gang. They've a nice plant, with an excellent layout featuring the same good housekeeping that I bragged about after visiting the J & L and Bryant Chucking Grinder plants, in Vermont, and the Auto Soler down in Atlanta.

George Tegen, who took me around, introduced me to the "family", so to say—Keith Gallimore, Ray Woytech, Erwin Kaiser, Bill Rutz, Everett Morgan, Don Lafling, Art Raeuber — all proud as peacocks over their product as they've a right to be. It's all precision stuff, from the Davis boring tool kits through midget to floor model G & L boring mills.

That eve, a ride to Oshkosh, skirting Lake Winnebago which is a lot of water, then to the Athearn Hotel where I renewed acquaintance with likable Hank Faith, of the G & L sales staff, who remembered me right away after having seen me once in Indianapolis several years ago, and a lot of other ASTEers whose names and faces I got scrambled up so I don't know where I first met 'em. Heck of a note!—embarrasses me no end.

They sat me at the head table, along with Ray Woytech, Nate Boynton, Len Kaufman, Jule Schommer (new Ch'man) George Tegen, Paul Rohling, Keith Gallimore and Bill Jorgensen, from where I had a ringside seat when Bill Rutz (presiding) swore in the new officers. What I like about that neck o' the woods is that the boys come from all over—Green Bay, Milwaukee, Madison, Fox River and points N.E.W.S.—and thus get to know each other besides promoting good fellowship and good tool engineering over a wide area.

Considering the wonderful receptions I've had wherever I've gone to our Chapters, it wouldn't be fair to extoll the Fond du Lac ASTEers over the rest. Yet, no one could have done more for my comfort and pleasure, and I'm glad I went even if I did have to wear red flannels. Thanks a million!

A good night's sleep, then to Cleveland and the Tool Engineers' Industrial Exposition where, on Sunday evening, I attended the "Preview" put on by Cosa Corporation, meeting Julius Mueller, prex, and Milton Thalberg, g.m., during the evening. Got to talking with one of the operators, only his English was limited so we spoke German (what little I know) until he told me he was French so we switched to that until I simmered down to some of the words I learned in Social (Woonsocket) when I thought I'd better quit.

They build wonderful tools, those Swiss—precision instruments rather than machines **per se**—as exemplified by the Cosa and Hauser lines, yet, we must not be blinded to the excellent qualities of American designed and built precision tools of which Pratt & Whitney's and Moore Special Tool Company's jig borers and grinders, among others, are outstanding examples. Through emulation for high goals we achieve the ultimate in precision manufacture.

It's not my purpose to cover the Show in this writing—Doris Pratt will do a much better job in the May ASTE News besides which we are to run a review number in May—but to hit the high spots of my own impressions. One of my pleasant interludes was an invitation to dinner by G & L's Bill Rutz (he's executive vice prex in charge of manufacturing, in case you don't know) at which I met Sid Little, Harry Soukup and Ira Maibie, of the G & L sales staff, and Mrs. Maibie, and Tom Fawick of Airflex Corp'n.

While I couldn't do justice to the fine dinner (I lack capacity) I revelled in conversation that was 'way over my head a/c it turned to music of which I don't know a grace note from a promissory but, having heard of Amati and Stradivarius, I managed an intelligent mien regardless. For one thing, I learned that a bow isn't just a stick and horsehair but an instrument in itself that a good fiddler thinks nothing of paying $8,000 for. As an associate but strictly non-playing member of a symphony society, I now have a better appreciation of music. Thanks a lot, Bill!

As for the Show, it was one huge success, for which Joe Friel can take a big bow, shared by Harry Conrad and the H.Q. staff and the scribes of the various trade papers. Sure, sure, "ve vas dere too, Sharley"—The Tool Engineer, I mean, all (few) of us on the working staff except Bob Steiger, our new art director who is doing a swell job as you'll see from now on but who couldn't come. Also present were Clarence Etter, Jim Hartnett and Austin Cragg, of The Tool Engineer advertising staff. Nice boys, as you all know.

Toward the end of the first day, I thought the attendance was a mite light as compared to two years ago, and I was right—there were four less. My eagle eye! But they made up for it the rest of the week so you could hardly get near some of the exhibits. Everybody enthusiatic and not one gripe did I hear about hotel reservations this time, for which thanks to Charley Hasse and Margaret Howes of H.Q. Good workers deserve a pat on the back.

Some liquid cheer with John Lengbridge, who is shortly coming through with a bang-up series on aluminum press work, and a hello with Eric Crawford, Tom Alison, and Bill Dawson, among the Canadians, and Len Singer, debonnaire as ever, and Bob Douglas, who proudly introduced his life partner a/c which I was momentarily dazzled. Nice couple, both having shown excellent judgment in the choice of helpmeets. (So did I, although I got the best of the deal.)

George Highberg and Stan Peterson, the latter with his winsome Mrs. of whom Stan's dad-in-law John Sundkvist must be right proud, and Betty Buckeye of Buckeye Tools, whose charms were enhanced, if anything, since we met in Houston last fall. Looked in vain for the "goddess in the

chine" that DoAll Company was to veil, but all rubbing of Alladin's mp failed to bring her to view.

Rip Collins, Dean Sauerman, Jake muth and George Exley, the latter ree respectively inviting me down to louston, St. Louis and Baltimore re-rding which I'll consider if I can ake it. Dave Nelson and Sigge Sven-n of Detroit Broach, the latter hot fter Doc (Ray) Nauth whom I located long with Bob Carlson after a while; Ben Hazewinkel who extolls Starrett ut Denver way; Ed Doogan and Clyde Mooney among the Irish tool engineers.

Speaking of Irish tool engineers, someone asked me to look up a visitor from Sweden—Hakon Ehrenborg—and I called the hotel. But that was St. Patrick's day, and someone answered: "Erin go Braugh? Yer darned tootin—an' come up and have some." Later, got a gander of Hakon along with two visitors from India. East meets West! Karl Bues, Anton Peck, Ed Raves and Les Hawes from California; Bill Fors, to tell me he is to handle the Geroter May line in Detroit; Jack Kuntz, ASTE slight-of-hand artist pulling a quarter from my ear but forgetting to give me the change.

Gold dust twins Jack and Joe Petz, from Poughkeepsie; Charles Gorham, proudly presenting protege Carl Hertlein; Bill Eichelman of Erickson Tools; Ernest Peterson, of Crystal Lake Grinders, all enthused over his exhibit but keeping an eye on a sapphire turning tool developed by Roger Waindle of Sapphire Products. Cooperation, eh? Julius Michelson, proudly showing his small drill sharpener—gosh, everybody was enthusiastic.

This time, didn't drop in to kibitz the Directors, figuring they'd do all right without me which they did. That goes for the House of Delegates, which put in three good men from a slate of outstanding candidates. Here's one for the book, though! After a li'l game of baseball—in which, incidentally, Bill Smila had to change the ground rules, drat his hide!—and a sleeping potion of Java and sinkers, I hied me to bed one night toward the wee-wee hours.

And right in the middle of the night—oh, about 6 A.M.—the phone rang and it was Deacon (H.T.) Sprott calling to ask would I present his credentials a/c he had to go out of town and would I get his banquet tickets besides. And there must 'a' been 600 other ASTEers in the hotel!

The Deacon was one of the gang that included Rip Collins and Art Denis who kept me up all night at St. Louis and wouldn't even give me a cup of coffee until I'd promised to give 'em more than I said I would. But I stuck to my guns and we'd have been there yet if someone hadn't opened the door so I could crash the guards, them guys being that stubborn.

Dick Smith of Hartford; Fred Dawless, Mike Raedecki and Ray Griffin of New Haven; John Ryneska and Al Forbes from Boston; Carl Holmer and Jim Knight from Peoria; George Balentine from Atlanta—the tool engineers just came from all over to see the Show. A "hello" with the Pratt & Whitney contingent, most of 'em looking right pleased as a result of the merger of Potter & Johnston which also pleased me and the other P & J friends plenty.

John Sylvester, friendly as ever, and Pratt & Whitney's Carl Moeller, all enthused over a new P & W thread lead checker. Stopped to kibitz while Prof Boston explained a mathematical formula to another savant. Al Nancarrow and Jim Barber, and Bill Klemm, as usual working on something new and apparently getting there. A gander at the new Lees-Bradner threading machine which works plenty fast, and a look-see at Ingersoll-Rand's line where Jack Lönn demonstrated an air drill with *beau coup* power. Everywhere you went, something new and something better.

Ran into Jack Hawkey at the Cleveland, and for a moment I tightened up a/c Jack has been one of the sharpest critics of The Tool Engineer—and I'll not quarrel with that since our critics have been a constructive force in shaping the magazine into what it is today. But Jack had nothing but the highest praise, a sentiment which I found to be almost unanimous among the hundreds of readers I met during the Show. But, we're not stopping—The Tool Engineer is just going to get better and better as we go along.

Also ran into Van Norman's Jim Scott who must have had his alligators along a/c he wasn't satisfied to run a tub o' water for his bath but flooded his room as well. All right, all right, Jim!—I heard all about it; the phone rang and there you were until your feet got wet. Happened to me at home one time—and did I catch it!

Saw a pipe floating across the lobby, but when I looked behind it it was Jim Weaver who, along with Walt Wagner, Joe Siegel, Frank Curtis, d'Arcambal and the rest of the past prexies have now formed a Past Presidents' Club which I hope will have better luck than the Hounds although I ran into Gardner Young who says they'll bay again as soon as we open the kennels. Jay Bowen and Ken Spalding, slanting the latest in die accessories; Ed Dickett, looking none the worse for his tooth pulling, and Fred Kessenich to say he never got my letter. But I wrote it, Fred—honest!

Lot o' people at the Banquet, where Willis Overland's James Mooney laid down a pattern for "America's participation in European Recovery" although, the press table (?) having been placed in a remote corner, we didn't get to hear or see very much of what went on. Thought I recognized one of the actors in the floor show as a prominent ASTEer, but couldn't be sure a/c the makeup with which he was plentifully covered at the grand finale. While there, ran across Philip Fishback, recognition being mutual a/c both of us had seen the other's pic. Also, had a get-together with Bill Jarvis who exuded satisfaction with proceedings as a whole. And now for Los Angeles in October, not next March as I erroneously stated in a previous Andygrams. Time flies!

Leaving Cleveland late on Friday, I was about to take the train when Ed Beyma of Central States Engineering and A. J. McLaren of the Cross Company offered me a ride in the latter's car. And what a ride! Trees down, houses and barns scattered all over the landscape and a church steeple crashed through the roof a/c a wind that, at times, must have reached 100 mph! Except for a few blocks, Toledo was completely blacked out a/c power lines were down for a radius of many miles. I've seen worse storms in my time, but this one was really a hummer. But, thanks to a good driver, we got home okay.

Back at work, I was pleasantly surprised to receive a book—Old World Wisconsin — sent me to commemorate my visit to Giddings & Lewis and Fond du Lac Chapter. It was autographed by all of the G & L family previously mentioned and, like the Boston Book presented by Boston Chapter, will take its place among my favorite books. It typifies that friendliness which has made the ASTE unique among technical societies.

To round out the international picture pen knife from Bill Sjöstedt, chief tool engineer with Scania-Vabis, Sweden, whom I had the pleasure of showing around when he was here last year. It's really a work of art! Like several of our other members over there, Bill is a most enthusiastic ASTEer and has many friends over here. Hands across the sea, you know.

To round out the international picture for the nonce, a letter from Gene Lahr, of Sao Paulo, Brazil, saying that he had run into John A. Jay, ASTEer from Scenectady who is down there in connection with opening up a new General Electric plant. So, the twain figured that possibly other ASTEers might be going down there, and if so, will they call on 'em so maybe they can arrange a meeting. According to Jay, a number of South Americans have become interested in the Society since reading The Tool Engineer. The "book" must be all right, eh? Incidentally, Gene says he never received the ASTE Directory. How come?

Well, I guess that's about all I have room for right now, but I'll give you more in May although not necessarily saving the best to the last. 'Til we meet again, then,

ASTEely yours

Andy

Directory of A.S.T.E. Chapter Chairmen

AKRON, NO. 47
Second Monday *
George A. Irwin, *Chairman*
243 Malacca Ave.
Akron, Ohio

ATLANTA, NO. 61
Third Monday *
George W. Brown, *Chairman*
Big A. Road,
Toccoa, Ga.

BALTIMORE, NO. 13
First Wednesday *
George A. Exley, *Chairman*
Bendix Radio Div.
E. Joppa Road, Towson
Baltimore 4, Md.

BINGHAMTON, NO. 35
Second Wednesday *
Roger E. Coles, *Chairman*
506 Mountain View Dr.,
Union, N. Y.

BOSTON, NO. 33
Second Thursday *
William W. Young, *Chairman*
Pratt & Whitney Div.
238 Main St.,
Cambridge, Mass.

BUFFALO-NIAGARA FRONTIER, NO. 10
Second Wednesday *
Garrett Kingston, *Chairman*
38 Schauf St.,
Buffalo 11, N. Y.

CEDAR RAPIDS, NO. 71
Third Wednesday *
Raymond E. Bextine, *Chairman*
Link-Belt Speeder Corp.
1201 Sixth St., S. W.,
Cedar Rapids, Iowa

CENTRAL PENNSYLVANIA NO. 22
Second Tuesday *
Albert Anderson, *Chairman*
446 N. Duke St.,
Lancaster, Pa.

CHICAGO, NO. 5
First Monday *
Harold M. Taylor, *Chairman*
Supplies, Inc.
564 W. Adams St.,
Chicago 6, Ill.

CINCINNATI, NO. 21
Second Tuesday *
George H. Simon, *Chairman*
7 W. Pike St.,
Covington, Ky.

CLEVELAND, NO. 3
Second Friday *
Jack H. Schron, *Chairman*
Glenn Tool & Mfg. Co.
716 E. 163rd St.,
Cleveland 10, Ohio

COLUMBUS, NO. 36
Second Wednesday *
Albert W. Montague, *Chairman*
829 Vernon Rd.,
Columbus 9, Ohio

DAYTON, NO. 18
Second Monday *
E. J. Seifreat, *Chairman*
1006 Harris Bldg.,
Dayton, Ohio

DECATUR, NO. 58
Second Monday *
Fred W. Sobottka, *Chairman*
1620 E. Cleveland Ave.,
Decatur, Ill.

DENVER, NO. 77
First Wednesday *
Ben J. Hazewinkel, *Chairman*
2355 Jasmine St.,
Denver 7, Colo.

DETROIT, NO. 1
Second Thursday *
Andrew Carnegie, *Chairman*
2970 W. Grand Blvd.,
Detroit 2, Mich.

ELMIRA, NO. 24
First Monday *
James F. Deegan, *Chairman*
Lower Maple Ave.,
Elmira, N. Y.

ERIE, NO. 62
First Tuesday *
Vincent Peck, *Chairman*
1110 W. 30th St.,
Erie, Pa.

EVANSVILLE, NO. 73
Second Monday *
Clyde E. Yost, *Chairman*
700 Villa Dr.,
Evansville, Ind.

FAIRFIELD CTY., NO. 6
First Wednesday *
William C. McDonough, *Chairman*
R.F.D. 2, Danbury Rd.,
Wilton, Conn.

FLINT, NO. 68
Third Thursday
Harlan T. Pierpont, Jr., *Chairman*
1677 Woodburn Dr.,
Flint 3, Mich.

FOND DU LAC, NO. 45
Second Friday *
Jule P. Schommer, *Chairman*
59 Polk St., Oshkosh, Wis.

FORT WAYNE, NO. 56
Second Wednesday *
Leonard Roebel, *Chairman*
206 E. Sherwood Terrace,
Ft. Wayne, Ind.

FOX RIVER VALLEY, NO. 72
First Tuesday *
Roger F. Waindle, *Chairman*
123 So. Jackson Ave.,
Batavia, Ill.

GOLDEN GATE, NO. 28
Third Tuesday *
Ernest C. Holden, *Chairman*
3122 Guido St.,
Oakland 2, Calif.

HAMILTON, NO. 42
Second Friday *
Gordon Hall, *Chairman*
29 Nelson Ave.,
Burlington, Ont.

HARTFORD, NO. 7
First Monday *
William F. Jarvis, *Chairman*
Chas. L. Jarvis Co.
Pease Ave.,
Middletown, Conn.

HOUSTON, NO. 29
Second Tuesday *
Dean Saurenman, *Chairman*
Baker Oil Tools, Inc.
Box 3048, Houston 1, Texas

INDIANAPOLIS, NO. 37
First Thursday *
Clarence M. Wetzel, *Chairman*
4910 E. 12th St.,
Indianapolis, Ind.

KANSAS CITY, NO. 57
First Wednesday *
F. Ward Osborn, *Chairman*
819 West College,
Independence, Mo.

LITTLE RHODY, NO. 53
Third Wednesday *
Wilfred J. Pender, *Chairman*
43 Seba Kent Road,
Pawtucket, R. I.

LOS ANGELES, NO. 27
Second Thursday *
Leslie F. Hawes, *Chairman*
2616 W. 78th Pl.,
Inglewood, Calif.

LOUISVILLE, NO. 54
Second Wednesday
John A. Black, *Chairman*
3733 N. Western Pkwy.,
Louisville 12, Ky.

MADISON, NO. 75
1st Tues. After 1st Mon. *
Lorenz A. Leifer, *Chairman*
13 Oxford Pl.,
Madison 4, Wis.

MID-HUDSON, NO. 74
Second Tuesday *
Llewellyn H. Tenney, *Chairman*
76 Grand Ave.,
Poughkeepsie, N. Y.

MILWAUKEE, NO. 4
Second Thursday *
Joseph Ebner, *Chairman*
4215 N. 26th St.,
Milwaukee, Wis.

MONTREAL, NO. 50
Second Thursday *
G. S. Clarke, *Chairman*
Coteau Rouge Rd.,
Longueuil, Que.

MUNCIE, NO. 70
Second Wednesday *
William J. Brown, *Chairman*
1212 Bundy Court,
New Castle, Ind.

NASHVILLE, NO. 43
Third Friday *
C. L. McCaffrey, *Chairman*
1513 Ashwood Ave.,
Nashville, Tenn.

NEW HAVEN, NO. 41
Second Thursday *
Alton V. Pollard, *Chairman*
American Brass Co.
55 Liberty St.,
Ansonia, Conn.

NEW ORLEANS, NO. 60
Second Wednesday *
Carl Hazlewood, *Chairman*
6574 General Haig,
New Orleans 19, La.

NEW YORK, GREATER, NO. 34
First Monday *
W. E. Lentz, *Chairman*
630 Victory Blvd., Grymes Hill,
Staten Island, N. Y.

NIAGARA DISTRICT, NO. 65
First Thursday *
H. F. Gorth, *Chairman*
62 Thomas St.,
St. Catharines, Ont.

NORTH TEXAS, NO. 51
Second Friday *
John A. Lapham, *Chairman*
2700 Western Ave.,
Fort Worth 7, Texas

NORTHERN NEW JERSEY, NO. 14
Second Tuesday *
Charles B. Carlson, *Chairman*
Ediphone Division
Thomas Edison, Inc.
West Orange, N. J.

PEORIA, NO. 31
First Tuesday *
Gordon Swardenski, *Chairman*
214 Weiman Ave.,
Bartonville 7, Ill.

PHILADELPHIA, NO. 15
Third Thursday *
Samuel R. Boyer, *Chairman*
5865 Hadfield St.,
Philadelphia 43, Pa.

PITTSBURGH, NO. 8
First Friday *
Walter S. Risser, *Chairman*
1332 Franklin Ave.,
Pittsburgh 21, Pa.

PONTIAC, NO. 69
Third Thursday *
Eldon Hall, *Chairman*
5048 Mound Rd.,
Warren, Mich.

PORTLAND (MAINE), NO. 46
Fourth Friday *
Harold D. Andrews, *Chairman*
Twin City Machine Co.
31 Mechanics Row
Auburn, Maine

PORTLAND (OREGON), NO. 63
Last Tuesday *
Everett Werner, *Chairman*
2919 S.E. Clay Ave.,
Portland 15, Ore.

POTOMAC, NO. 48
First Thursday *
Daniel T. Hilleary, *Chairman*
116 N. Highland St.,
Arlington, Va.

RACINE, NO. 2
First Monday *
William Reinhardt, Jr., *Chairman*
837 Blaine Blvd.,
Racine, Wis.

RICHMOND, NO. 66
Second Tuesday *
Ralph McKee, *Chairman*
Webster, Ind.

ROCHESTER, NO. 16
First Monday *
Emmett W. Moore, *Chairman*
156 Burlington Ave.,
Rochester 11, N. Y.

ROCKFORD, NO. 12
First Thursday *
H. A. Nelson, *Chairman*
Barber Colman Co.
150 Loomis St.,
Rockford, Ill.

ST. LOUIS, NO. 17
First Thursday *
Harrall M. Creasey, *Chairman*
Box 708-6, Route 6,
Sappington 23, Mo.

SAN DIEGO, NO. 44
Second Tuesday *
Raymond W. Peters, *Chairman*
6952 Fitch Court,
San Diego 11, Calif.

SCHENECTADY, NO. 20
Second Thursday *
John Stedman, *Chairman*
54 Broderick St.,
Albany 5, N. Y.

SEATTLE, NO. 39
Second Tuesday *
Clyde A. Peterson, *Chairman*
Rt. 2, Box 210
Bellevue, Wash.

SOUTH BEND, NO. 30
Second Tuesday *
Norman R. Smith, *Chairman*
3941 Cottage Ave.,
Mishawaka, Ind.

SPRINGFIELD (ILLINOIS), NO. 64
First Tuesday *
H. C. Chambers, *Chairman*
1817 Dial Court,
Springfield, Ill.

SPRINGFIELD (MASS.), NO. 32
Second Monday *
George R. Brown, *Chairman*
52 Barber St.,
Springfield, Mass.

SPRINGFIELD (OHIO), NO. 76
Fourth Thursday *
Joseph E. Charters, *Chairman*
The Oliver Corp.
270 Monroe St.,
Springfield 99, Ohio

SYRACUSE, NO. 19
Second Tuesday *
Lester H. Collins, *Chairman*
177 Ridgeway Ave.,
Syracuse, N. Y.

TOLEDO, NO. 9
Second Wednesday *
Lawrence F. Rothert, *Chairman*
2008 Giant St., Toledo 6, Ohio

TORONTO, NO. 26
First Wednesday *
John W. Lenghridge, *Chairman*
257 Wychwood Ave.,
Toronto, Ont.

TRI CITIES, NO. 23
First Wednesday *
Lennart N. Dahlen, *Chairman*
901 43rd St., Rock Island, Ill.

TWIN CITIES, NO. 11
First Wednesday *
Harold D. Sullivan, *Chairman*
4038 28th Ave. S.
Minneapolis 6, Minn.

TWIN STATES, NO. 40
Second Wednesday *
W. C. Hadfield, *Chairman*
33 Pine St., Springfield, Vt.

WESTERN MICHIGAN, NO. 38
Second Monday *
Edmund E. Cedarquist, *Chairman*
523 Fremont Ave. N.W.,
Grand Rapids 4, Mich.

WICHITA, NO. 52
Second Wednesday *
Leigh S. Icke, *Chairman*
657 N. Terrace Dr.,
Wichita 6, Kansas

WILLIAMSPORT, NO. 49
Second Monday *
Delbert M. Lowrey, *Chairman*
1233 Park Ave.,
Williamsport, Pa.

WINDSOR, NO. 55
Second Monday *
Alfred J. Hodgins, *Chairman*
995 Lawrence Rd.,
Windsor, Ont.

WORCESTER, NO. 25
First Tuesday *
Ralph E. Rawling, *Chairman*
22 Elm St., Worcester, Mass.

* CHAPTER MEETING NIGHT

Holland Elected ASTE President

IRWIN F. HOLLAND, Gen. Supt., Small Tool and Gage Dept., Pratt & Whitney, Div. Niles-Bement-Pond Co., W. Hartford, Conn., was elected President of ASTE at the Annual Meeting of the Board of Directors in Cleveland, March 17.

I. F. Holland

Also chosen for the 1948-49 term are: R. B. Douglas, Pres., Godscroft Ind., Ltd., Montreal, Que., 1st Vice-Pres.; H. L. Tigges, Vice-Pres., Baker Bros., Inc., Toledo, Ohio, 2nd Vice-Pres.; V. H. Ericson, Vice-Pres., Johnson de Vou, Inc., Worcester, Mass., 3rd Vice-Pres.; W. B. McClellan, Special Engr., The Gairing Tool Co., Detroit, Mich., Secy.; and G. A. Goodwin, Chief Process Engr., Master Electric Co., Dayton, Ohio, Treas.

The House of Delegates, meeting March 18, elected a Board of Directors to take office at the next Semi-Annual Meeting. The Directors-Elect are K. L.

(Continued next page)

18 Members Win Welding Awards

Hamilton, Co-Author Lincoln Grand Prize Manuscript

IN THE THIRD international Design-for-Progress Award, sponsored by The James F. Lincoln Arc Welding Foundation of Cleveland, Ohio, an ASTE member shared the top prize of $13,200, and 17 others, jointly or individually, placed prominently among winners of the $200,000 competition.

Participating in the 1st Grand Award was **Douglas W. Hamilton** of Baltimore Chapter, former Welding Foreman, Aeromatic Propeller Dept., Koppers Co., Inc., Baltimore, Md. Mr. Hamilton, now of Hamilton Associates and Sales Engineer for the L. A. Benson Co., was co-author of a paper entered in the Aircraft Classification with Paul F. Hackethal, Chief Engineer, and Clarence C. Mast, Shop Superintendent, at Koppers.

Their manuscript described how welded design of a variable pitch propeller hub has brought new safety, economy and speed to light, private planes.

Other Society affiliates included in the recent announcement of awardees are:

Ethert M. Barrett (Los Angeles Chapter), Plant Superintendent, Clayton Mfg. Co., El Monte, Calif.; 2nd Award, Functional Machinery Classification, $2200.

Hugh T. Monson (Cleveland Chapter), Chief Industrial Engineer, The Euclid Road Machinery Co., Cleveland, Ohio; 4th Award, Welderies Classification, $1050.

William A. Janson, also of Cleveland Chapter, Draftsman, Development Dept., Clark Controller Corp., Cleveland, Ohio; 2nd Award, Functional Machinery: Electrical Machinery Classification, $500.

William W. Hudson (Tri-Cities Chapter), Methods Engineer, John Deere Plow Works of Deere & Co., Moline, Ill.; 4th Award, Personal Service Machinery: Farming Machinery Classification, $150.

Howard Sechrest (Madison Chapter), Owner, Howard Machine & Welding Co., with Robert J. Jacobs, Manager, Jendix Corp., Madison, Wis.; 4th Award, Functional Machinery: Metal Forming Machinery Classification, $150.

Fred J. Kampmeier (Rockford Chapter), Chief Engineer, The Ingersoll Milling Machine Co., Rockford, Ill., and **Joseph S. Blachut** (Detroit Chapter),

ASTE Winners of Lincoln Design-for-Progress Awards

E. B. Banks

E. M. Barrett

Howard Sechrest

W. A. Janson

H. T. Monson

D. W. Hamilton

Walter Brown

H. F. Wahl

W. W. Hudson

J. S. Blachut

W. H. Kerr

H. W. Rose

G. A. Denker

F. J. Kampmeier

Warren Bradley

H. A. Tedman

I. G. Freeman

Carl Van Ausdall

former Machine Designer, The Cross Co., now Tool Engineer, Lee Engineering Co., Detroit, Mich.; $100 Awards, Functional Machinery: Metal Cutting Machinery Classification.

Iver G. Freeman (Worcester Chapter), Factory Manager, Grinding Machine Div., Norton Co., Worcester, Mass.; $100 Award, Functional Machinery: Conveying Machinery or Parts Classification.

Ernest B. Banks (Elmira Chapter), Engineer, Typewriter Research Dept., Remington Rand, Inc., Elmira, N. Y.; $100 Award, Industry Machinery: Business Machinery or Parts Classification.

Walter Brown (Columbus Chapter), formerly Project Engineer, International Derrick & Equipment Co., Columbus, Ohio, now Asst. Chief Engineer, The Brewster Co., Inc., Shreveport, La.; with William H. Griffith, Chief Mechanical Engineer of the Columbus firm; $100 Award, Industry Machinery: Petroleum Machinery or Parts Classification.

Wade H. Kerr (Muncie Chapter), Tool Designer, Warner Gear Co., Div. of Borg-Warner Corp., Muncie, Ind., and **Hudson A. Tedman** (Los Angeles Chapter), Special Machine Designer, North American Aviation, Inc., Los Angeles, Calif.; $100 Awards, Industry Machinery, Jigs and Fixtures Classification.

Carl Van Ausdall (Richmond Chapter), Proprietor, Van's Service, Liberty, Ind.; $100 Award, Personal Service Machinery: Farming Machinery or Parts Classification.

Harold F. Wahl (Portland, Ore., Chapter), former Engineer with Hrubetz and Bushnell, Salem, Ore.; now Supervising Engineer, Tractor Equipment Div., Hyster Co., Portland, Ore.; sole winner, $100 Awards, Welderies: Plant Classification.

Fond du Lac Chapter claimed the greatest Society representation in the contest. **G. A. Denker,** Plant Manager, **Warren Bradley**, Chief Engineer, and **H. W. Rose**, Plant Superintendent, Damrow Bros. Co. of that city, divided the 4th Divisional Award of $150 in the Industry Machinery: Jigs and Fixtures Classification.

Among papers submitted by entrants from nearly every industrial country, machinery classifications of the contest predominated, emphasizing arc welding's mounting importance in cutting production costs.

Utilizing technical data acquired in manuscripts submitted by the 483 winners of the 404 awards, the Lincoln Foundation expects to add several volumes to its library of textbooks. Chief of these will be "Design for Welding," scheduled for early publication.

Sutherland Named V.-P.

Los Angeles, Calif.—J. K. Sutherland has been appointed Vice-President in Charge of Sales for Benchmaster Manufacturing Co., the firm has announced.

Since joining Benchmaster last July, Mr. Sutherland has established a wider distribution of the company's products.

An ASTE member, he is well known in machine tool circles.

Holland Elected

(Continued from page 45)

Bues, Golden Gate Chapter; H. E. Collins, Houston; J. J. Demuth, St. Louis; T. J. Donovan, Jr., Philadelphia; R. W. Ford, Pittsburgh; H. J. Richards, Boston; and G. S. Wilcox, Jr., Detroit, in addition to Mr. Holland, Mr. Douglas and Mr. Tigges.

Retiring President W. B. Peirce of Pittsburgh also is a Director for the ensuing year.

A complete, illustrated report of the Annual Meeting and Tool Engineer's Industrial Exposition will appear in the May *ASTE News*.

New Automatics Perform Complicated Operations

Erie, Pa.—W. H. Spence, Sales Director for Brown & Sharpe Mfg. Co., Providence, R. I., was guest speaker at a meeting of Erie Chapter, February 3, in the General Electric Community Center.

W. H. Spence

His discussion of automatic screw machines was accompanied by slides showing new features and examples of complicated work done on these machines.

After the lecture Mr. Spence and two associates from Brown & Sharpe answered questions from the floor.

Chairman M. H. Hetzel presided and conducted a short business session and election of officers.

Ninety-four members and guests were present for the meeting, preceding social hour and smorgasbord.

Electronics on Doorstep Of T.E., Says Burnett

Hartford, Conn.—While Science has frequently bypassed him until recent years, it is now camping on the tool engineer's doorstep—at least in the field of electronics, in the opinion of Henry J. Burnett, Electro-Mechanical Engineer, Pratt & Whitney Aircraft Div., United Aircraft Corp.

Mr. Burnett, speaking before 160 Hartford Chapter members March 1, gave a non-technical explanation of electronics, illustrated with blackboard drawings.

Turning to possible developments in the next five years, he painted a word picture of automatic, foolproof equipment operated by inexperienced workers.

Precision grinders and lathes with automatic electronic controls were foreseen as increasing production and reducing waste. Advantages and limitations of induction heating were compared with furnace heating. Improvements are needed in both systems, the speaker stated.

Other electronic devices named by the speaker for future development included electronic gages accurate to a few millionths of an inch, a micro-finish analyzer, light beam and photo cell gages.

First Vice-President Irwin F. Holland installed the Chapter officers for the ensuing year. Those inducted are: William Jarvis, Chairman; Clayton Parsons, First Vice-Chairman; Don Huntting, Second Vice-Chairman; Henry Kuryla, Secretary; and Robert Edmunds, Treasurer.

Chairman Richard Smith conducted the technical session and reported on Chapter activities during the year. Mr. Jarvis, the incoming Chairman, introduced his committee chairmen.

Other News In This Issue

Colleges Resist Specialized Education—Ellingson

Syracuse, N. Y.—ASTE's rapid growth has contributed greatly to our high standard of living, according to Dr. Mark Ellingson, President of Rochester Institute of Technology.

Speaking at the Executives Night dinner of Syracuse Chapter, held February 17 in the Roof Garden of the Onondaga Hotel, Dr. Ellingson traced specialized education from the beginning of man. Changes in the method of education have been slow due to resistance of certain colleges and universities in evaluating the importance of the specialist. Dr. Ellingson called ASTE the heart of American industry, whose success in advancing the tool engineering profession has been widely recognized.

Inform Management of New Methods

Toastmaster H. D. Mozeen introduced I. F. Holland, First Vice President of the Society. Mr. Holland stressed the need of close cooperation between engineers and manufacturers. The tool engineer, he declared, must think in terms of accomplishment rather than of monetary reward. He must inform the executive of new methods and ideas and keep him abreast of technical developments.

Initiative, cited Mr. Holland, together with suggestion of new methods to management, is what the executive expects of the tool engineer. Through *The Tool Engineer* magazine, text books, data sheets and the forthcoming handbook, the society is seeking to keep tool engineers better informed for greater service to industry.

Carl Dietz, President of the Lamson Corp. and Past President of the Manufacturers Association of Syracuse, complimented the Society on its growth and achievements; on the contribution of tool engineering toward maintaining the American way of free enterprise.

Scholarship Announced

Lester Collins, First Vice-Chairman of the Chapter, presented a plan for sponsoring a three-year scholarship at Rochester Institute of Technology, for a worthy student of the H. W. Smith Technical School. The candidate will be carefully selected in order to bring honor to the growing profession of tool engineering.

Dr. Edward Lang, Principal of the Smith Technical School, expressed his appreciation of the opportunity to be afforded one of his students. Scholarships of this type will greatly encourage tool engineers of the future.

The dire need for expansion of specialist and technical education in the local school system, was affirmed by Dr. David Patton, Superintendent of Syracuse Schools.

Commends Industry Training

Donald Kidd, Director of Vocational Education in the Syracuse schools, spoke on the merit of education within industry for training specialists. On-the-job training, he said, has been an effective aid to developing young tool engineers in manufacturing plants.

The following officers were sworn into office by Mr. Holland: Lester Collins, Chairman; Fay Atkinson, First Vice-Chairman; John Sauda, Second Vice-Chairman; Carl Hoffman, Treasurer; and Robert Fulford, Secretary.

Hugo Klix was elected Delegate, with Ray Coseo as Alternate.

Dinner Dance for Ladies

Toledo, Ohio—Toledo members entertained their ladies February 14 with a dinner dance in the Secor Hotel Ballroom.

During intermission a floor show was presented featuring Dr. Witherspoon and his "Cureall" remedies, two chefs with trick musical instruments, and as a special treat, vocal selections by Chairman Albert Hage.

Morris Teague, Entertainment Chairman, was in charge of arrangements.

Paul Spor's Royal Commanders furnished dance music for the 134 tool engineers and their guests.

* * *

On the 10th, approximately 100 members accepted an invitation to visit the Korber Brewing Co. Following a trip through the plant to inspect the equipment and processing, refreshments were served to the visitors.

It is the men who take ventures who make the world.

—Sir Wilfred T. Grenfell

4 Garvey Children Die As Fire Destroys Home

Detroit, Mich.—While Lawrence M. Garvey and his wife, Irene, attended a meeting of Brooklands residents to discuss the problem of community fire protection, their own home was being destroyed in a blaze that snuffed out the lives of four of their children, February 28.

Ranging from 18 months to nine years of age, three sons and a daughter were asleep on the upper floor with their brother, Lawrence, 13. The oldest boy, awakened by smoke, rushed out and attempted to extinguish the fire with a garden hose.

Pressure was insufficient to have any effect on the flames, and he was unable to re-enter the house to rescue the other children. Another sister, Barbara, 16, who was attending a dance, escaped the holocaust.

Fire departments, summoned from nearby towns made a futile attempt to save the building, handicapped by poor equipment and inadequate water supply.

Mr. Garvey, a production foreman at the Ford Motor Co. Mound Road plant, built the five-room home himself 11 years ago. Defective wiring is believed to have caused the fire.

Fellow members in Detroit Chapter ASTE, have subscribed a substantial amount to assist the stricken family. Neighbors and community groups also are raising funds to help rebuild the house.

Hoke and Schott Promoted

Cleveland, Ohio—Maurice J. Hoke has been promoted from Chief Engineer to Works Manager of the crankshaft and camshaft divisions of The Ohio Crankshaft Co., W. C. Dunn, President, has announced.

A graduate engineer from the University of Cincinnati, Mr. Hoke is a member of Tau Beta Pi and Pi Tau Sigma engineering honor societies.

Alfred H. Schott, formerly Chief Process Engineer, has been advanced to Master Mechanic of the crankshaft and camshaft divisions, the announcement continues.

Both are Cleveland Chapter members.

Speakers' table guests at Syracuse Chapter Executives Night included, from left: Hugo Klix, Chapter Chm.; Lester H. Collins, V.-Chm.; Carl F. Dietz, Pres., Lamson Corp.; I. F. Holland, 1st V.-Pres., ASTE; H. D. Mozeen, meeting chairman; Dr. Mark Ellingson, Pres., Rochester Institute of Technology; David H. Patton, Superintendent, Syracuse Public Schools; Dr. Edward Lang, Principal, Smith Technical High School; and Donald Kidd, Director of Vocational Education for the Syracuse public school system

Prominent in Portland (Maine) Chapter's Executive Night program were, from left, standing: Charles Paige and John Johnston, Past Chairmen; Eldon Wishart, First Vice-Chairman; Prof. Justin O. Johnson of Portland Junior College; Carl Bohlin, Chairman; Prof. Benjamin Kent and Dean Paul Cloke, University of Maine; Merton Corson, Secretary; and Frank Thomes, Treasurer. Seated: John Lindegren, National Membership Committeeman of Worcester; C. C. Gorham, National Educational Committeeman, Boston; and V. H. Ericson, National Treasurer, from Worcester

Silver Brazing Economies Stressed by Setapen

Williamsport, Pa.—Principal speaker at the February meeting of Williamsport Chapter was A. M. Setapen, Manager, Engineering Div., Handy & Harman, New York City. His subject was "Silver Brazing."

In setting forth the various steps of the process, Mr. Setapen emphasized that the additional cost of material is more than saved through elimination of burring, sandblasting, and machining operations encountered in conventional welding methods.

After brazing, the only operation required is the removal of excess flux with mild acid or hot water. The part is then ready for plating or other finishes.

Prior to the technical session, Clark Hile, Chief Draftsman, Titan Metal Manufacturing Corp., Bellefonte, Pa., gave an after dinner talk, "Brass Products as Produced by Titan Metal."

Tracing the company's development from their original brass rod product, through diecasting and forging, to the present output of 72 brass alloys, some of which have a tensile strength of 120,000 pounds psi, he showed samples, and a film of plant operations.

Winning candidates in the annual election of officers are: Chairman, D. M. Lowrey; First Vice-Chairman, E. H. Sears; Second Vice-Chairman, W. K. Belknap; Secretary, R. S. Huskin; and Treasurer, Morris Smith.

Ford Executives Promoted

Windsor, Ont.—Three members of Windsor Chapter, ASTE, shared in recent promotions at Ford Motor Co. of Canada, Ltd.

C. G. Sampson becomes General Production Superintendent, appointing W. D. Walker, Plant Superintendent. Norman Douglass, formerly Divisional Superintendent, fills the position of Assistant Plant Superintendent vacated by Mr. Walker.

Mr. Sampson is a Past Chairman of the Chapter.

Less Operator Fatigue Trend in Tool Design

San Francisco, Calif.—Present tendency in designing tools is to eliminate operator fatigue, especially where women workers are concerned, said Fred N. Kruse of Moore Machinery Co., in discussing "Machine Tool Trends" before 75 members and guests attending a recent dinner meeting of Golden Gate Chapter.

Anti-friction bearing, hardened ways, automatic and forced feed lubrication, he added, are other factors being incorporated wholly or partially in modern design. For accurate repetitive work, tracer controlled machine tools are meeting success.

Notwithstanding these developments, Mr. Kruse said, there is still a need for better all around work handling equipment, as it is not uncommon to spend twice as much time in loading and unloading a machine as in producing a part.

The machine tool industry is continually challenged by the development of cutting tools and harder alloys to be cut. The advent of carbides in 1926 demanded sturdier tools; in 1930 inception of negative angles called for new designs; ten years later carbide milling got its start; then, with the war years, the industry was pressed for bigger and better tools to increase production, reduce tolerances on tougher metals, and provide for better finishes.

A machine tool he defined as "a power driven device capable of removing metal in the form of chips by performing one or more of the operations of turning and boring, planing and shaping, milling, grinding or broaching, and also able to reproduce itself in whole or in part."

Following Mr. Kruse's talk, Fred B. Roth showed a film depicting air-tracer lathes, attachments developed by Monarch Machine Tool Co. to mass produce parts from bar stock quickly and accurately. Mr. Roth later answered many questions concerning the remarkable fixture.

ASTE Educational Aims Presented to Executives

Portland, Me.—Approximately 50 members, guest executives and educators braved 15 below zero weather to attend Portland Chapter's recent Executives' Night dinner at the Elmwood Hotel in Waterville.

Principal speaker was Charles C. Gorham, Boston Chapter Education Chairman and a member of the National Education Committee.

The Society's aims and achievements in the field of education formed the subject of his address. Progress in installing tool engineering courses at institutions of higher learning, the formation of Chapter student groups, and publication of textbooks were reported by Mr. Gorham.

Sponsorship of ASTE approved apprenticeships and subsidization of tool engineering training, both by industry and through state legislation in establishing scholarships, also were discussed.

National Treasurer V. H. Ericson of Worcester commented on the Society's growth and activities.

A film, "Safety in Railroad Shops," was presented by Earle Towne of Derby, through the courtesy of the Bangor & Aroostook Railroad.

Guests introduced by Chairman Carl Bohlin were: Dean Paul Cloke and Prof. Benjamin Kent of the University of Maine, Prof. Justin O. Johnson, Portland Junior College; Carl P. Fogg of Hollingsworth & Whitney Co., E. L. Shepard, Keyes Fibre Co., both of Waterville; H. D. Bickford, Lombard Traction Engineering Co.; Edward B. Schwamb, Fay & Scott, Dexter; E. R. Andrews, Hyde Windlass Co., Bath; and Howard Stevens, S. D. Warren Paper Co.

A committee composed of Past Chairmen John Johnston and Charles Paige, Second Vice-Chairman Eldon Wishart, and Secretary and Past Chairman Merton Corson were in charge of the function.

Grinding Processes Shown In Illustrated Lecture

Milwaukee, Wis.—Ernest V. Flanders of Jones & Lamson Machine Co., Springfield, Vt., addressed Milwaukee Chapter, February 12, on the subject of "Thread, Form and Crush Grinding."

His slide-illustrated talk included grinding wheel research, automatic thread grinding machines, surface speed, and types of wheels.

In the ensuing business session, the annual election of officers was conducted by Richard Ford, Past Chairman.

Chosen to head the group for the 1948-49 term are Joseph Ebner, Chairman; Arthur G. Gudert, First Vice-Chairman; Herbert Heimann, Second Vice-Chairman; Walter Behrend, Secretary; and Walter Klein, Treasurer.

Paul Wernicke was elected Delegate, and Paul Butzin, Alternate.

One hundred and thirty-five members and guests were present for the technical session and business meeting.

Montague New Chairman

Columbus, Ohio—A. W. Montague was elected Chairman of Columbus Chapter at the annual meeting, February 11, in Hotel Fort Hayes.

W. K. Armagost was named First Vice-Chairman, and T. F. Starkey, Second Vice-Chairman. All three were advanced from the posts in which they served during the 1947-48 term.

Also elected were M. D. Sherman, Treasurer, and G. M. Amstutz, Secretary.

The technical session was conducted by Frank P. Cavenagh of the Sales Promotion Dept., The Warner & Swasey Co.

His topic, "Exploring the Results of Single Point Carbide Turning," was a summation of several years' research in the company laboratories, to determine future power and rigidity requirements of machine tools using carbide cutting tools.

As a result of this experimentation, Warner & Swasey feels that today's tools will be adequate for the next ten years or so. In conjunction with this talk, a film, "Blue Chips," showed excellent slow motion shots of carbide tools in action.

The session closed with a question and answer period, a number of members receiving assistance on personal problems in the use of carbide turning tools.

Forty members and guests were present for dinner, with an additional 10 or 15 attending the technical session.

Rose Made Sales Manager

Albany, N. Y.—Harry H. Rose of Schenectady Chapter, ASTE, has been named General Sales Manager of the Simmons Fastener Corp., according to an announcement by Charles A. Simmons, President.

For three years he has been a sales engineer with this company and has adapted its products to numerous applications in various industries.

Earlier he was associated with Simmons Machine Tool Corp., the parent company.

New Chucking Work Head Compensates for Errors

Windsor, Ont.—William & Wilson, Ltd., Canadian representatives of Bryant Chucking Grinder Co., Springfield, Vt., were hosts at the February 9 meeting of Windsor Chapter in the Prince Edward Hotel.

One hundred members and guests heard L. C. Gilchrist, District Sales Manager of the Bryant Michigan office, relate complex problems overcome in tooling for the wartime manufacture of machine tools to grind aircraft parts.

Of especial interest was the sample unit of a fuel injector assembly, ground in the inside diameter to a tolerance of five millionths of an inch. Mr. Gilchrist emphasized particularly the exacting limits required in building machines to accomplish work demanding such close tolerances.

Striving for Greater Precision

This adherence to rigid precision, Mr. Gilchrist continued, has in no measure abated with the cessation of hostilities and changeover to peacetime products. On the contrary every effort is being bent to make chucking grinders as good as is humanly possible.

Various types of chucking machines being built at the parent plant were shown in a color-sound film. The pictures revealed steps in building of chucking assemblies, their installation, accuracy, and ease of operation.

Rigidity of the machines is of utmost importance, for a good grinding finish, as is a new work head vertically and horizontally adjustable to compensate for existing errors caused by wear in the machine.

Following the film there was a lengthy question period, the speaker proving highly conversant with his subject.

Prior to the technical talk, officers were elected. A. J. Hodges becomes Chairman for the 1948-9 year, W. A. Thomas, First Vice-Chairman; W. F. Tyson, Second Vice-Chairman; A. E. Carley, Treasurer; and H. Porter, Secretary.

Screw Machine Advances Lower Production Time

San Francisco, Calif.—An authoritative speaker from their own ranks addressed Golden Gate Chapter at a meeting in Oakland, February 17.

Rollin J. Lobaugh, Managing Owner of Pacific Screw Products Co., drew on his quarter-century of experience in the screw machine field to trace the industry to its present high stage of development.

The first turret, he stated, was invented in 1873 by a Mr. Spencer at Hartford, Conn., followed by the multiple spindle twenty years later. Since 1890 when the screw machine business was established on an industry basis with a capitalization of about $1,600,000, it has soared to an estimated net worth of $233,500,000 in the United States alone.

In 1917 it took 800 man-hours to build an electric refrigerator. With surface speeds increased from 100 to 250 feet through better automatic screw machines and cutting tools, the time has been reduced to 200 man-hours.

Keen interest was displayed in a series of slides featuring the latest Brown & Sharpe machines and their set-ups, presented by Mr. Lobaugh.

After-dinner speaker was J. W. Lindgren of International Correspondence Schools who gave an inspirational talk based on his hobby for words and their connotation in varying situations.

Rockford Heads Installed By Vice-President Johnson

Rockford, Ill.—Incoming officers of Rockford Chapter were installed March 3 during a meeting at the University Club Building. Opening the meeting with a resume of his term in office, Ernest Seborg, retiring Chairman, asked George C. Johnson, Third Vice-President, to administer the oath of office to the following:

Howard Nelson, Chairman; Karl B. Kaiser, First Vice-Chairman; George Rigeman, Second Vice-Chairman; George Torrence, Third Vice-Chairman; Harry Carlberg, Treasurer; and Ernst Norrman, Secretary.

After inducting the officers, Mr. Johnson presented Mr. Seborg with a Past Chairman pin.

Chairman Nelson introduced Roy Hansen of the Research Dept., Philip Morris & Co., Ltd., who traced the history of tobacco, giving an interesting description of modern methods for processing tobacco leaves into finished cigarettes.

Economic importance of the industry as a source of government revenue and the immense advertising programs sponsored by large tobacco companies were also discussed.

At the conclusion of Mr. Hansen's speech, Messrs. Johnson, Nelson, and Seborg showed colored slides of their trip to the ASTE convention at Houston, Texas, last year.

Smorgasbord was served to the 100 members attending the meeting.

Third Vice-President George C. Johnson (second from right) completes ceremony of installing Rockford Chapter officers. From left: George Torrence, Third Vice-Chairman; George Rigeman, Second Vice-Chairman; Karl Kaiser, First Vice-Chairman; Howard Nelson, Chairman; and (right) Ernest Seborg, retiring Chairman of the northern Illinois group

S.S. Machining Problems Blamed on Poor Tooling

Grand Rapids, Mich.—Most problems in machining stainless steel are the result of improper tooling, according to E. Von Hambach, Research and Development Engineer, The Carpenter Steel Co., Reading, Pa.

This po' it was emphasized by Mr. Von Hambach during a lecture, "Application and Fabrication of Stainless Steels," given before a meeting of Western Michigan members, February 9, in the Rowe Hotel.

Grades of stainless steel, their application and machining were discussed and illustrated with slides. Important in cutting tools are chip breakers and curlers, while lubrication is a necessity in machining stainless steel, the speaker stressed. By proper tool grinding, he continued, a finish equivalent to grinding can be obtained.

Mr. Von Hambach presented a display of production parts illustrating the versatility and many practical applications of stainless steel. Unusual interest was shown in the question and answer period.

After dinner speaker was George Hoogerhyde of the American Seating Co., who discussed "Die and Press Layout for Production Runs." Fifty members and guests were present.

Made Technical Director

Cleveland, Ohio—Appointment of Dr. H. B. Osborn, Jr., to the post of Technical Director of the company's TOCCO division has been announced by W. C. Dunn, President of The Ohio Crankshaft Co.

H. B. Osborn, Jr.

In this post Dr. Osborn will devote his time to exploring and developing new fields for induction heating equipment.

Coming to Ohio Crankshaft in 1940 as Research and Development Engineer, Dr. Osborn was named Sales Manager of the TOCCO Div. two years ago.

Nationally known for technical lectures and papers, Dr. Osborn has completed a term as ASTE National Public Relations Chairman and as First Vice-Chairman of Cleveland Chapter.

Yost Wins Chairmanship Of Evansville Group

Evansville, Ind.—Officers for the 1948-49 season were elected at a business and dinner meeting of Evansville Chapter, February 9, in the Vendome Hotel.

The new Chapter executives are: Chairman, Clyde H. Yost, President, Ken Standard Corp.; First Vice-Chairman, Walter P. Schneider, Assistant Master Mechanic, Servel, Inc.; Second Vice-Chairman, Herman Muehlbauer, Superintendent, Seeger Refrigerator Co.; Secretary, Joseph Waltman, of International Harvester Co.; and Treasurer, Roman Wannemuehler, President, General Tool & Die Corp.

Retiring Chairman Frank J. Hausfeld, Jr., Planning Engineer with International Harvester, was elected Delegate, with Paul Rhodes, Vice-President, Ken Standard Corp., as Alternate.

Good Conveyor System Requires Careful Study

Rochester, N. Y.—February meeting of Rochester Chapter was held at Rochester Institute of Technology, with 125 members present to cast ballots in the annual election of Chapter officers and to hear Arthur S. Hamilton, Jr., Consulting Engineer, and Chairman of the Rochester ASME Chapter, discuss "Conveyorized Assembly."

Success of any good conveyor system, Mr. Hamilton emphasized, lies in comprehensive study of the entire job—a detailed break-down of each operation and its accurate timing so that work does not pile up in one area and cause a lag in another section. Each operator should be kept busy at all times with parts flowing smoothly through each operation.

Handling Adds Cost but Not Value

Dividing his topic into three classifications: carry, push or pull (such as trucks); and gravity power (such as chutes or roller conveyors), the speaker pointed out that since transporting parts adds cost but not value, it should be done efficiently.

Assembly methods, he continued, are usually of the floor, bench, or conveyor type. The latter category may be broken down to include floor, roller, belt, Monorail, dial assembly press, and pallet.

Before a conveyor assembly plan is completed, the group was told, it should be freely discussed with foremen and supervisors. Details and sequence of operations should be studied to guard against difficulties that might arise, contrary to theory. It is well to provide spare machines or stations where trouble might occur, for use only when regular equipment is out of service. Only enough operators for proper, balanced production would be assigned on such a line.

After the talk Mr. Hamilton conducted a discussion period, answering many interesting questions raised by the tool engineers.

During a dinner meeting preceding the technical session, G. A. Ellestad of the Bausch & Lomb Optical Co. Patent Dept. talked on "Curious Inventions." His interesting and amusing explanations were well illustrated with lantern slides.

At the close of the meeting, results of an election held earlier in the evening were announced as follows: Chairman, Herbert O. Simon; First Vice-Chairman, William R. Gordon; Second Vice Chairman, Emmett W. Moore; Third Vice Chairman, James O. Horne; Secretary, Robert T. Barnett; and Treasurer, Fred E. Bittner.

Executive Board members elected for three years are: Raymond Hall, Joseph Gray and Gerald Sick; for one year, Clifford E. Sears.

Lock Details Design Of Electric Hoists

Pittsburgh, Pa.—"Modern Design Electric Hoists" was the technical subject presented by Frank Lock, Chief Engineer of the Electric Hoist Dept., Yale & Towne Mfg. Co., Philadelphia Div., at the February 6 meeting of Pittsburgh Chapter.

W. S. Risser

After enumerating primary design considerations as: (1) adaptability, (2) simplicity of construction and operation, (3) freedom from repairs, (4) interchangeability of parts, and (5) ruggedness, Mr. Lock elaborated on each of these requirements.

Also included in his discussion was a detailed description of the various elements of electric hoists, such as: motor, suspension frame, cable drum, cable, gear train, load brake, bearings, motor brake, controller, and load hook.

Slides supplemented the lecture and a film, "It's Your Money," showed a wide variety of Yale & Towne electric lifts and trucks in operation. A lively question and answer period followed.

Officers elected during the business session are: W. S. Risser, Chairman; Frank T. Boyd, First Vice-Chairman; G. C. Wood, Second Vice-Chairman; H. L. Harper, Secretary; and W. J. Bickmore, Treasurer.

Retiring Chairman Paul H. Magnus was elected Delegate to the Annual Meeting, with Mr. Risser as Alternate. Sixty-five members and guests attended the dinner meeting.

Wilcox Named Director, Eng'g Society of Detroit

Detroit, Mich.—Grant S. Wilcox, Jr., Staff Specialist to the Factory Manager, Plymouth Div., Chrysler Corp., has been appointed to the Board of Directors of the Engineering Society of Detroit.

G. S. Wilcox, Jr.

Named to fill a vacancy caused by the death of J. H. Walker, Mr. Wilcox has the distinction of being the youngest Director ever to serve the ESD. He has been Vice-Chairman and Chairman of the Affiliate Council of Engineering Societies and is credited with originating the proposal for holding the annual refresher courses, sponsored by the Society and the Council.

A National Director of ASTE, he is a member of the National Standards Committee, has headed the Standards Committee Data Sheet Sub-Committee, and is a Past Chairman of Detroit Chapter, ASTE.

His degree in Mechanical Engineering was conferred by the University of Michigan. He is a Registered Professional Engineer and the author of articles on aviation and tool engineering.

New Operating Procedure Implements Data Sheet Procurement

A SUCCESSFUL pattern for Chapter Standards Committee data sheet procedure is being pioneered by Detroit Chapter, under the chairmanship of Charles M. Smillie, local machine tool manufacturer.

Readily workable and easily followed, the plan is aimed at implementing the National Committee's program to supplement and widen the range of product data sheets issued to the membership.

Dividing his committee into three groups, Mr. Smillie has set up sub-committees to handle planning, contact, and checking.

Headed by the Standards Chairman, the Planning Committee formulates policy and operational procedure. After screening, names of manufacturers having products suitable for ASTE Data Sheets are compiled into classified lists, including company address, and top executive's name.

Manufacturers, Committee Meet

Heads of such firms are then invited by letter to attend a meeting of manufacturers in their field, for a presentation of the ASTE Data Sheet program. At this meeting the Standards Chairman explains in detail benefits accruing to sponsors of Society data sheets, their service to tool engineers, merits of the ASTE numerical indexing system of grouping competitive manufacturers, printing specifications, and costs.

Descriptive brochures, distributed to the guest executives, assist them in following the Chairman's explanation.

After outlining the program the Chairman invites questions, answered by members of the Contact Committee. This serves also to acquaint the prospect and contact man for later negotiations.

A sub-chairman appointed by the Standards Chairman guides the Contact Committee. He assigns members of his group to assist specific manufacturers in preparing data sheets and in making contractual arrangements. He is also responsible for keeping progress reports of the status of prospective accounts.

Sales engineers and other outside men who can make such calls in the course of business are chosen for this committee.

May Suggest Changes

Function of the Checking Committee, whose sub-chairman also is named by the overall Chairman, is to review proposed data sheets from a physical and mechanical standpoint. When necessary, mutually beneficial changes are suggested to the manufacturer. Personnel of this committee is composed of tool designers, layout men, and others who use and specify products.

Following the Checking Committee's approval, the Data Sheet Sub-Committee of the National Standards Committee assigns index numbers and reviews recommendations or changes suggested by the Contact Committee.

If the data sheets are not satisfactory to the Sub-Committee, they are returned to the Checking Committee for review. Then the contact man takes them to the sponsor for discussion of revisions. The corrected sheets are submitted once more to the Checking Committee, then passed along to the Data Sheet Sub-Committee who, within 48 hours, grant final approval for printing, and authorization to use the ASTE emblem of approval.

All committees are strongly organized and coordinated by a series of report forms. Roll call is taken at all committee meetings, and inactive members are impressed with the necessity of regular attendance.

An important phase of Detroit Chapter Standards Committee activity is in acquainting area manufacturers with ASTE Data Sheet specifications.

Primarily interested in having their promotion material reach tool engineers, parts and equipment manufacturers are quick to realize that, if catalogs are laid out in accordance with ASTE Data Sheet format, it is relatively simple to furnish data sheets for Society distribution.

The stylized flow chart shown on this page will facilitate inauguration of the model operating procedure among other Chapters. Only through well-organized efforts of Chapter Standards Committees in securing cooperation of local manufacturers can the National Standards Committee realize its goal of providing the membership with specifications in every field of production equipment.

Polley Explains UMT At Election Meeting

South Bend, Ind.—South Bend Tool Engineers, meeting February 10 at the Indiana Club, elected officers for the coming year.

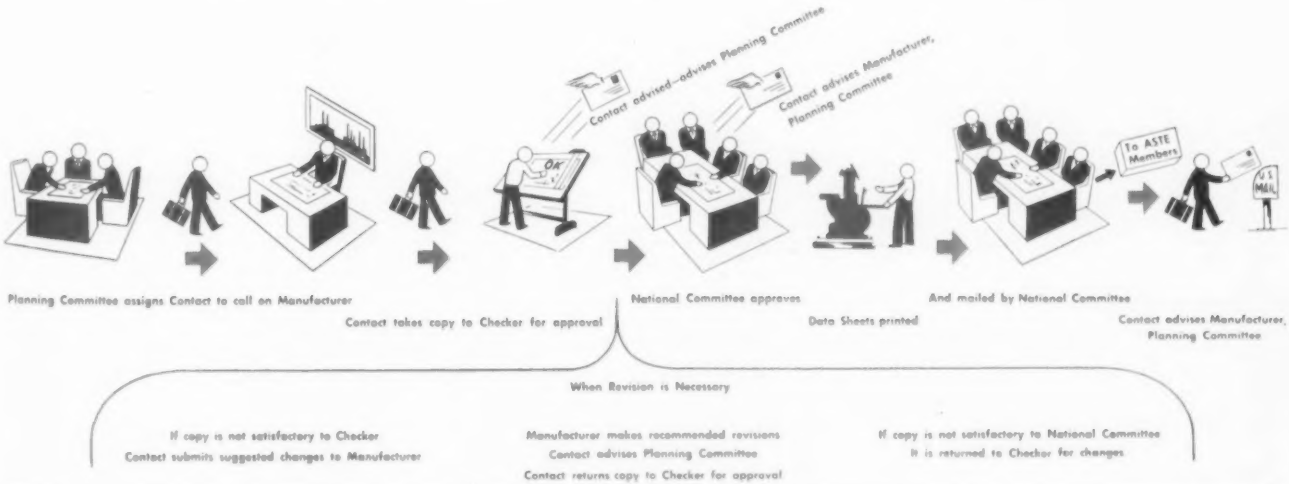
The successful candidates are: Norman R. Smith, Chairman; Burdette Davis, First Vice-Chairman; Paul Beeler, Second Vice-Chairman; Preston Bidwell, Treasurer; Maxwell L. Cripe, Secretary; Edgar Helm, Delegate; and Carl Stevason, Alternate Delegate.

Speaker of the evening was Capt. George O. Polley who discussed "The Pro and Con of Universal Military Training." The plan, Capt. Polley stated, is principally a physical education program designed to select and train the youth of the nation for limited military service. Its cost would be approximately one to two billion dollars a year, a negligible amount, he feels, compared to the cost of a modern war.

A motion picture, "Golden Horizons," also was presented.

Operating Procedure for Data Sheet Procurement

Detroit Chapter Standards Committee, C. M. Smillie, *Chairman*



Mid-Hudson Elects Tenney Hears Die Casting Talk

Poughkeepsie, N. Y.—Llewellyn H. Tenney was elected Chairman of Mid-Hudson Chapter, succeeding John L. Petz, named Chapter Delegate to the national convention, at a meeting of the group February 10.

Other officers elected were Joseph L. Petz, First Vice-Chairman; Fred J. Neuman, Second Vice-Chairman; J. Harry Keller, Secretary; and Noel De Cordova, Treasurer. Mr. Tenney was also named Alternate Delegate.

Charles Brownell headed the Nominating Committee, assisted by James L. Hillis and Joseph Crane.

Following the business session, approximately 75 members and guests heard Charles R. Maxon, of the Market Development Div., New Jersey Zinc Co., on the subject, "Die Casting Practice." Since the introduction of zinc die casting in the late 1920's, Mr. Maxon stated, consumption of zinc alloys has increased from 20,000 to more than 200,000 tons annually.

Gives Step-by-Step Procedure

Important stages in developing the process to its present state of efficiency were shown in a Kodachrome sound film. During a lively discussion period, Mr. Maxon was bombarded with questions concerning extent, limitation, and precautions necessary in die casting as compared with other methods of fabrication.

Major steps in adopting the process, the speaker stressed, are: A survey of potential die casting requirements; procurement from a reputable manufacturer of machinery best suited to the job; judicious selection of parts suited for economical die casting. Careful choice of parts to be die cast should permit a minimum cost reduction of 50%, compared with other methods.

Parts and dies should be designed in accordance with best die casting practice. Designs should be reviewed by experts, such as are maintained by the Jersey Zinc Co., before adoption.

"The die is the heart of the process," Mr. Maxon emphasized. "Select and train men with proper background in care and operation of the equipment. For best economical use of equipment, use multiple cavity dies up to the capacity of the machine. Use only high grade alloys of die casting metal. Maintain proper temperatures in the metal and in the die. Provide a separate pot for preheating metal, keep metal clean and up to alloy specification."

Discard First Few Castings

The first 15 or 20 castings, made while the die is warming up, should be discarded, he added. Careful handling should result in long die life. As many as 300 zinc die castings per hour have been produced from a single cavity die, while up to 5,760 have been turned out every 60 minutes with a multiple cavity die, the speaker concluded.

Prior to the business meeting, Albert Meyn, Director of Vocational Education in the Poughkeepsie school system, discussed "A Ringside View of the U. S. Situation in Panana." His talk was based on wartime experience as Director of Employee Utilization in the Canal Zone.

Proper Piping, Drainage Vital to Air Power System

Montreal, Que.—Improper design of piping installations and drainage facilities was blamed by A. S. Terry, General Sales Manager, The Bellows Co., as the greatest single trouble factor in operating air power systems, while addressing 83 Montreal members at a meeting February 12.

"Water traps should be located at all low spots in the system and drained at regular intervals," explained Mr. Terry, "and power source, such as the compressor, should be as close as possible to the work, spray booth, press, or machine tool, to reduce friction and leakage losses."

A sound film, showing many applications to machine tools, jigs, fixtures and presses, proved air power superior to mechanical devices in some instances, such as for drill press feeds, especially when the Bellows Hydro-Check or other control unit is used in conjunction with an air cylinder.

Purpose of the control is to cushion the bumpy action of air and to regulate the actual cutting operation and breakthrough of the drill. The Hydro-Check is a self-contained hydraulic unit equipped with a metering valve to adjust the flow of oil from one end of the cylinder, thereby controlling the speed of the feeding mechanism.

Also described was a non-rotating air motor having a control valve integral with the cylinder assembly, and equipped with a device to control the speed of the piston in both directions. Control valves may be manually, mechanically, or electrically operated. The standard motor gives a thrust of 10 times line pressure.

In answer to questions from members during an open discussion period, Mr. Terry gave additional information concerning air installations.

Sample air motors and Hydro-Checks were eagerly inspected by the audience after the meeting.

Officers elected at this meeting are: Chairman, G. S. Clarke; First Vice-Chairman, A. McKinney Rice; Second Vice-Chairman, M. A. Cote; Third Vice-Chairman, Samuel Pedvis; Secretary, M. G. Baker; and Treasurer, C. J. MacDowell.

M. A. Cote, Membership Chairman, reported three new members for the month, bringing the season's total to 30.

Winners in Detroit Chapter election of officers get a hand from their fellow members. From left: Andrew Carnegie, Chm.; G. T. Koch, 1st V.-Chm.; C. M. Smillie, 2nd V.-Chm.; M. O. Cox, Secy.; and C. G. Sharpe, Jr., Treas.

Carnegie New Chairman Of Motor Capital Group

Detroit, Mich.—Successful candidates in the February 12 election of Detroit Chapter officers are: Andrew Carnegie, Chairman; George Koch, First Vice-Chairman; Charles Smillie, Second Vice-Chairman; and C. Granville Sharpe, Jr., Treasurer. Monta Cox and Wayne Kay, both unopposed, were re-elected Secretary and Delegate, respectively.

W. B. Peirce, ASTE President, gave an address on the Society, its history and aims. Later, he and Albert M. Sargent, Past President, jointly answered questions from the floor, concerning the Society.

Other honor guests included former Presidents Joseph A. Siegel, William H. Smila, T. Bert Carpenter, and Walter F. Wagner. Each spoke briefly, in a reminiscent vein, of the organization's progress during the past sixteen years.

Lex, Asst. Gen. Manager

Detroit, Mich.—Appointment of Joseph R. Lex as Assistant General Manager of Progressive Welder Co, has been announced by John D. Gordon, Vice-President and General Manager.

A graduate of the University of Munich, Germany, Mr. Lex joined Progressive in 1946, following broad industrial experience as Plant Manager of Fisher Body Welding Div., General Manager of an aircraft parts firm and as a consulting engineer on production processes and equipment, particularly in the resistance welding field. He is a member of the Detroit ASTE Chapter.

Prize Contest Announced

New York City—A student prize for the best paper on diamond tools and their uses is being offered by the Directors of the Industrial Diamond Association of America, Inc.

Conditions and scope of the contest have not been determined, but the award will be offered through engineering departments of universities.

San Diego and Los Angeles members give close attention to the turning of a forming die for spinning a reverse flange. Demonstrations of metal spinning illustrated recent lecture by Leslie Hawes (right) before joint meeting of two Southern California Chapters. Insert shows another operator turning a flange on a shallow, round cylinde

Automatic Controls Assure Proper Clamping

Richmond, Ind.—Automatic and hydraulic machines and the respective fixtures to hold production parts while drilling, reaming and counterboring were discussed by LeGrande Terry, Chief Products Engineer, National Automatic Tool Co., speaking before Richmond Chapter at a recent dinner meeting in Hotel Leland.

Fixtures described included trunnion, rotating, and four, six and eight position type, with attendant bushing plates designed to the hole dimension shown on parts prints.

Electrical controls, he informed the group, prevent the machine's operation unless parts are clamped correctly and bushing plates are properly placed.

Problems encountered through heating of parts during machining and drilling, with subsequent change of dimension, were detailed by the speaker, who went on to explain how this difficulty can be overcome by the engineering department.

Mr. Terry outlined the procedure for cooperation between salesmen, customers and engineers in sketching a fixture to hold a production part. After the recommended fixture is approved, the machine is then designed and built, he said.

Pictures of representative machines and fixtures were passed around for inspection and comment by the approximately 75 members and guests present.

W. C. Miller, Principal of Economy High School, was the after dinner speaker.

A Nominating Committee was elected with the following results: Jesse Johnson, Chairman; John Farmer and Howard Evans.

Visitors included Don Showalter, first Chairman of the Chapter, now of Dayton, Ohio.

Situations Wanted

SALES ENGINEER—District representative for special machines and tools for Michigan industry. Fifteen years' experience. Can furnish excellent references. Please reply to Box 140, American Society of Tool Engineers, 1666 Penobscot Bldg., Detroit 26, Mich.

TOOL AND PRODUCT DESIGNER with 12 years' machinery sales and service background, available now for permanent connection in either capacity with established concern. Knows processing and interchangeable manufacturing problems. Willing to travel or locate anywhere in U. S. References and conmplete resume available upon request. Please address reply to Box 143, American Society of Tool Engineers, 1666 Penobscot Bldg., Detroit 26, Mich.

Hazewinkel Re-elected

Denver, Colo.—Ben J. Hazewinkel, District Representative for L. S. Starrett Co., was re-elected Chairman of Denver Chapter at the first annual meeting February 3.

Other officers chosen by the Society's youngest Chapter are: Clinton J. Helton, Owner, Helton Motor Sales, First Vice-Chairman; Edmund H. Malley, Special Machine Designer, Gates Rubber Co., Second Vice-Chairman; Warren L. Foss, Machine Tool Specialist, M. L. Foss, Inc., Secretary; and Willard G. Axtell, Chief Engineer, Shwayder Bros., Inc., Treasurer.

Mr. Hazewinkel was named Delegate, and J. R. Matthew, Engineer at Shwayder Bros., Inc., Alternate.

Hawes Demonstrates Metal Spinning Art

San Diego, Calif.—An actual demonstration of metal spinning highlighted a presentation on this subject given by Leslie F. Hawes, President, Southern California Metal Spinning Co., before a recent joint dinner meeting of San Diego and Los Angeles Chapters. Attendance chalked up a near record for the home Chapter.

Mr. Hawes, who heads the Los Angeles ASTE group, emphasized the broad field of spinning in all types of metals and discussed limitations concerning production requirements.

The advantage in spinning lies in the very low tooling costs necessary to produce parts in limited quantities. For production in excess of about 3000 pieces, deep drawing or casting are indicated since their higher output warrants investment in more costly tooling.

Where parts must be produced so quickly that conventional tooling would be prohibitive, metal spinning is the obvious method. In such cases, sample parts can be made within twenty-four hours.

By means of slides, many applications were shown to the audience, some of which could not have been effected economically by any other method. One example in this category was a shallow, round cylinder with a turned flange.

Operator Turns Dies, Spins Parts

Gathering around a spinning lathe the speaker had set up, the audience watched an operator turn wooden dies on which he later spun a number of parts. The novelty of an on-the-spot demonstration of the theory discussed aroused high enthusiasm for the process. A display of dies and tools and a large assortment of sample parts also were exhibited.

Ash trays, spun in Mr. Hawes' shops, were presented to the group.

Prior to the technical session, a Nominating Committee was elected. A film, "Tuna Fishing," was shown through the courtesy of High Seas Tuna Packing Co., Inc.

Chairman Ray Peters introduced the technical speaker, and Mr. Hawes presented the following Los Angeles guests: Robert H. Kollenborn, Chief Engineer, and Hartsel E. Reed, Factory Superintendent of Southern California Metal Spinning Co., Inc.; Rudolf Regen, General Machine Works; Wayne Ewing, Arrowsmith Tool and Die Co.; and B. W. B. Hutchinson, Marman Product

Bradford in New Post

Worcester, Mass.—Thomas C. Bradford of Worcester Chapter, ASTE, has been appointed Field Technical Engineer by Anderson Oil Company of Portland, Conn.

Mr. Bradford has twenty years' experience in the industrial oil and tool industry and has represented Anderson in New England since 1938.

He is also an active member of ASM and the Army Ordnance Association.

Waindle Wins Top Office In Fox River Election

St. Charles, Ill.—February meeting of Fox River Valley Chapter was held on the 3rd at Paul's Place in Aurora with more than 100 members and guests in attendance.

R. F. Waindle

In the annual election of officers, Roger F. Waindle of Batavia, General Manager of the Sapphire Products Div., Elgin National Watch Co., was named Chairman. Burt J. Phillips of Elgin, Owner of Phillips Auto Parts, was elected First Vice-Chairman; with C. H. Alltop also of Elgin, Superintendent of the Sheldon Machine Co., Inc., Second Vice Chairman; and William B. Hamlin of Geneva, Sales Representative for Jacobsen & Daw, as Secretary.

George Bodi of Aurora, Time Study Engineer for Barber-Greene Co., was voted in as Treasurer. R. G. Frogness of Aurora, retiring Chairman, becomes Delegate with G. M. Waller of Dundee, Alternate.

A color film, "Operation Crossroads", recently released by the Navy, depicted the Bikini atom bomb test. Another motion picture, "End Cutting Tools," showed the manufacture and use of such tools. Robert D. Seeley, Factory Service Engineer, Eclipse Counterbore Co., in a subsequent talk, elaborated on the bomb film, raising the point: Is the atom bomb a tool or a weapon? Discussing in detail end cutting tools, he listed seven causes of tool failures and how to eliminate them.

Glass Fiber Adaptable As Industrial Material

Toledo, Ohio—Air filters, heat, cold, and electrical insulation, and fire-proof fabric—all made of glass—were the subject of a discussion by Roy J. Black, Manager of Electrical Div., and H. R. Hogendobler, Chief Engineer, Owens-Corning Fiberglas Corp., at a recent Toledo Chapter meeting.

Mr. Hogendobler explained various forms of Fiberglas and characteristics of each. By means of an illustrative chart, he showed methods used to produce these fibers and properties making them applicable to their respective purposes.

Flexibility of the material, he added, depends upon the diameter of the fiber. For textiles, the glass thread must be many times finer than a human hair.

Application of Fiberglas as insulation for electrical conductors, compared with conventional materials, was detailed by Mr. Black. He demonstrated the relative fire hazard of each when overheated.

In conclusion, a Technicolor film, "Watts in Glass," described various uses in the electrical industry. When applied to motor windings, the result was motors of much smaller size, having the horsepower rating and other characteristics of larger ones with standard insulation.

Correct Cutting Fluids Said to Reduce Scrap

Chicago, Ill.—W. H. Oldacre, President, D. A. Stuart Oil Co., Ltd., lectured March 1 on the importance of proper lubrication for various machining operations, before a joint meeting of Chicago Chapter, ASTE, and the American Society of Lubrication Engineers.

Mr. Oldacre began by describing chip formation in metal cutting and the role played by the cutting fluid in cooling the tool and work, and in lubricating the latter.

Properties Shown in Graphs

With graphs he showed hardening properties and cooling rates of various types of oils. The presence of active sulphur to avoid welding of metal to cutting tools, the addition of wetting agents to oils, and the use of inhibitors to prevent rust were also mentioned.

Manufacturers can reduce scrap appreciably with a proper cutting fluid program, said Mr. Oldacre. Slides illustrated all of the points discussed.

In summarizing, he listed the most important functions of cutting fluids as: regulating temperature by dissipating heat, preventing welding of chip to tool, and washing away chips.

Arthur Mackmann, President of Amgears, Inc., spoke on "Manufacture, Design and Usage of Gears."

Factors determining the material and design of gears, according to the speaker, are horsepower transmitted, speed of operation, nature of load, and duration of cycle. Common steels used in gear manufacture were also described.

Use Fewer Types of Cutting Oils

Although machine manufacturers specify lubricating oils, selection of cutting fluids is often left to the operator. In one plant cited by the speaker, the 38 cutting oils being used were eventually reduced to four.

Machining of gears, application of cutting fluid to tools, lubrication of transmissions, and tumbling operations were shown with slides.

R. L. Stapleton, Chairman of the Conference Committee, Chicago Technical Conference, outlined plans for the annual Chicago Production Show and Technical Conference.

C. B. Cole, ASTE Director, installed the incoming Chapter officers. As his first official act, Chairman H. M. Taylor presented F. J. Schmitt, retiring Chairman, with a Past Chairman pin.

Approximately 200 members attended the dinner meeting at the Furniture Club of America.

Plays "Bubbles Concerto"

Fort Wayne, Ind.—Wondering whether a "Bubbles Concerto" might be a novel musical treat or a vaporous version of the Sally Rand terpsichorean technique, Fort Wayne members were all agog for the feature attraction of their February 11 meeting.

But when Eiffel G. Plasterer, "The Bubble Man," began his performance, they learned it was neither. A member of the Huntington, Ind., High School faculty, Mr. Plasterer accomplished incredible feats with evanescent soap bubbles, interlarding his repertoire with scientific revelations.

As the climax of the entertainment, a seven-year old boy was encased in an ordinary soap bubble film.

After-dinner speaker was Capt. L. J. Dockal who discussed "National Security."

Emphasizes Social Aspect Of Tool Engineering

Chicago, Ill.—It is not enough that tool engineers design tools for the manufacture of consumer goods; they must become more socially minded to be an increasingly effective force in a design for better living on a world-wide scale.

A. E. Rylander

A. E. Rylander, Technical Editor of *The Tool Engineer*, speaking before Chicago Chapter February 2, went on to urge closer friendliness among confreres and a broader perspective of the problems of others.

As Americans, he declared, we have every reason to be proud of our country where each individual can work out his own destiny. But the majority of the so-called "submerged third" can and must be raised to economic parity lest they become a permanent liability. And the way to economic parity is through higher employment and purchasing power, dependent upon better tools and production methods.

Our problem as tool engineers, the speaker concluded, is to hold down unit costs in manufacturing that more people may buy the products of labor.

Chemist Describes How Glue Is Manufactured

Williamsport, Pa.—A group of Williamsport Chapter members and guests heard Charles R. Harer, Chief Chemist, Keystone Tanning & Glue Co., in a recent talk on "Hide Glue, Its Manufacture and Use."

Making of hide glue from the raw material until it reaches the consumer was outlined by Mr. Harer. Gelatine, he explained, is very closely allied to glue. Raw material of higher quality is used in hide glue for industries such as woodworking, abrasive, match, artificial silk, blue print and bond paper, bookbinding, and leather belting.

Louis H. Bardo, Chapter Chairman, conducted the election of a Nominating Committee composed of Jesse L. Strasburg, J. Harold Shafer and Lester H. Lantz.

WE NEED A PICTURE

of your Chapter meeting for this page. Send photos to THE TOOL ENGINEER.

Tool Engineers' Handbook Authors

Biographical Briefs

B. T. Anderson, Chief Electrical Engineer, Sundstrand Machine Tool Co., Rockford, Ill., is known in many ASTE Chapters for his lectures on the "Application of Electronically Adjustable Speed Motors to Machine Tools."

Other audiences addressed by Mr. Anderson include the ASTE Annual Meeting at Philadelphia and the Westinghouse Machine Tool Electrification Forum.

An electrical engineer with Sundstrand since 1937, he is a member of the American Institute of Electrical Engineers.

* * *

Son of an engineer-inventor, **Madison L. Crawford** joined the Engineering Dept. of Clark Tructractor Div., Clark Equipment Co., at Battle Creek, Mich., shortly after Pearl Harbor.

Two years later he was given charge of a new department devoted to surveys and material handling research. Working with both the Armed Forces and industry, he made studies of new methods and devices, results of which were included in the Air Corps Material Manual, the Army and Navy Material Handling publications, and "Material Handling" by Harry Stocker.

As Statistician of Material Handling Research, Mr. Crawford has prepared manuals on the brick and clay, cotton, paper, and glass industries, and for his own company, in addition to assisting in nationwide surveys in transportation, citrus handling, and warehousing industries.

He has lectured before industrial and traffic groups in major manufacturing centers, has prepared papers on Material Handling which have been delivered in Canada and abroad, and writes for national publications.

His early business years following college were spent in advertising and sales promotion.

* * *

Starting in 1936 as blank cutter and spinners' helper, **George F. Farley**, Vice-President of Sales, Milwaukee Metal Spinning Co., Milwaukee, Wis., learned all manufacturing phases of the business, advancing to Production Manager, then Sales Manager. Late in 1944 he was named to his present office.

A native of Columbus, Wis., he was associated with the Wisconsin Telephone Co., after completing his education at the University of Wisconsin and Marquette University.

Herman Goldberg *Burnham Finney* *B. T. Anderson* *C. A. Reimschissel*







G. F. Farley *M. L. Crawford* *J. C. Straub* *G. H. Sheppard*

Internationally-known in the publishing world, **Burnham Finney** needs no introduction to tool engineers.

Now Editor of *American Machinist*, he has served as Detroit Editor of this publication, as well as for *The Iron Age* and *Business Week*, simultaneously handling an assignment as special writer for *The New York Times*. From his prolific pen have also come "Arsenal of Democracy" and contributions as a special writer for *The American Mercury*.

In Cincinnati, Ohio, where he was born and graduated from its University, Mr. Finney began his writing career as resident editor of *The Iron Age*.

During a visit to England in 1944 to inspect war plants and confer with industrialists and government officials, the American technical journalist was a guest of the British Ministry of Production.

He is a member of the Board of Directors of McGraw-Hill Book Co., and of Phi Beta Kappa.

* * *

Herman Goldberg, President of Snow Manufacturing Co., Chicago, Ill., maintains that he was practically born and reared in a machine shop.

Certainly his fund of mechanical knowledge bears out such an assertion. Always a welcome figure on the lecture platform, Mr. Goldberg frequently sets up machines and gives actual demonstrations of drilling and tapping. As further proof of the logic of his theories for correct drilling and tapping, he permits observers to perform the operations for their own satisfaction.

In addition to giving lectures before engineering societies and shop classes, Mr. Goldberg has written a number of technical articles for trade papers.

* * *

Nearly three decades ago **Charles A. Reimschissel** joined Landis Machine Co. of Waynesboro, Pa., as Foreman of Die Head Assembly.

Through aptitude for designing and improving die heads and tangential chasers, he had advanced to the post of Chief Development Engineer. As further recognition of his mechanical ingenuity, he holds more than 25 patents, with others pending.

ASTE Chapters and other technical groups are familiar with his lectures and articles appearing in trade journals.

* * *

Instrumental in perfecting numerous outstanding saw and file procedures during his 15 years' experience with the sawing industry, **George H. Sheppard** heads the research laboratory of The DoAll Co., Des Plaines, Ill.

Under his direction, the laboratory collaborates with other recognized institutes on quantitative and reproducible experiments, solves industrial production problems concerning sawing and continuous filing, and establishes sawability and fileability of many types of materials.

Also associated with the DoAll Technical Institute, Mr. Sheppard has written numerous technical articles.

* * *

Author, lecturer and researcher, **John C. Straub** is an authority on shot peening. Before taking charge of research in this field for The American Wheelabrator & Equipment Corp., Mishawaka, Ind., he had devoted years to its study.

At General Motors Research Laboratories in Detroit he was associated for 13 years with J. O. Almen, working on a variety of mechanical problems, including methods development in analyzing gearing.

With Mr. Almen he is co-author of the paper, "Factors Influencing the Durability of Automobile Transmission Gears," published in *Automotive Industries*. For several years his time was largely spent conducting fatigue tests in connection with shot peening and in correlating fatigue results with shot peening procedure.

More recently his articles on the subject have been published in trade periodicals and by his present company. Many engineering society groups have heard his lectures.

Production Control, Seat Of Handling Problems

Elmira, N. Y.—Material handling in the shop is definitely up to the production control department and the origin of all handling problems is rooted there according to Paul R. Minich, Industrial Engineer, Rack Engineering Co., Pittsburgh, Pa.

P. R. Minich

Mr. Minich expressed this opinion during an address, "Material Handling in the Efficiently Organized Plant," given February 2 before a dinner meeting of Elmira Chapter members in the Mark Twain Hotel.

Tool designers, engineers and production control men found the slide and film illustrated lecture valuable and timely, with industry endeavoring to secure maximum production at minimum expenditure in equipment, space, manpower and time.

Slides and motion pictures showed various methods of handling materials and comparative savings. Three-dimensional model plant layouts were described as effective in dealing with non-technical personnel unfamiliar with blueprints and drawings. A spirited question and answer period followed the talk.

Another film, "The Phantom," presented by the McDonnell Aircraft Co. of St. Louis, Mo., was represented as the first of its kind in the history of jet propelled aviation. Photographed in part at sea on the Navy aircraft carrier *Franklin D. Roosevelt*, it showed a jet propelled plane that could take off, land, and compete with regulation carrier-based fighter planes for maneuverability at low speeds.

Chairman Edward Stachel presided over the meeting and conducted the annual election of officers.

Nominees elected are: James Deegan, Chairman; Patrick Pecoraro, First Vice-Chairman; Donald K. Smith, Second Vice-Chairman; Bert J. Siefried, Secretary; and Norman L. Miller, Treasurer.

Retiring Chairman Edward Stachel was elected Delegate, and Past Chairman George Morceau, Alternate.

Mr. Deegan, the Chairman-Elect, led the technical session and introduced the speaker. Sixty members and guests, including tool design students from the Elmira Veterans School, were present.

Langhammer Wins Medal

Detroit, Mich.—Andrew J. Langhammer, President, Amplex Mfg. Co., Div. of Chrysler Corp., has received the fourth annual medal awarded by Stevens Institute of Technology for outstanding achievement in the field of powder metallurgy.

In a lecture, February 17 at Hoboken, N. J., sponsored by the Institute's Powder Metallurgy Laboratory there, Mr. Langhammer discussed "Industrial Application of the Powder Metallurgy Process."

The Detroit ASTE member is the first awardee to win the medal for distinguished work in powder metallurgy as applied to bearings and machine parts.

Carbides Offer Economies In Canadian Mining Field

Montreal, Que.—"Canada's vast mining industry is a fertile field for cemented carbide applications, W. T. Muirhead, Vice-President and General Manager, A. C. Wickman (Canada) Ltd., Toronto, Ont., told Montreal members in the course of a recent illustrated lecture, "Cemented Carbides in Industry Today."

Use of carbide in rock-drill bits effects savings for mine operators, because of its extremely long life compared to the best steel now used for the purpose, he continued.

Describing various grades of carbide now available, Mr. Muirhead emphasized the importance of selecting the type recommended by the manufacturer for the work to be done.

Versatile in Application

The wide range of applications covered in the lecture included tool-bits, drills, reamers, masonry drills, milling cutters, gages, press tools, saws and wire-drawing tools. Proper grades, correct cutting and clearance angles on cutting tools, care in grinding, and protective storage of tools were all stressed.

An impressive exhibit of sample tools and typical applications held the interest of the group for some time after the meeting.

A possible solution to the housing shortage was presented when C. Kinghorn, Vice-President in charge of Engineering, Cresswell Roll Forming Co., Ltd., described his company's aluminum houses, showing a film depicting their construction and erection.

Experiments in Canada and the West Indies, he said, have proved these houses comfortable over a wide range of temperatures and climatic conditions. Of particular interest to tool engineers were methods used in producing the easily assembled components, especially the rolls used to form the various sections.

Rolls Process Aluminum Strip

A coil of aluminum strip was shown being fed into a special rolling machine, then formed progressively into intricate shapes by passing through a series of rolls, and emerging from the other end of the machine, cut to size and ready for assembly. Holes were punched in the strip during the operation by special rolls with piercing punches in the top set and dies in the bottom.

Through self-locking seams rolled into the edges of the wall, ceiling and roof sections, nails, bolts, rivets and screws were eliminated in assembling the large panels.

A display of sample sections attracted considerable attention.

First to be held in the Chapter's new meeting place, Canadian Legion Memorial Hall, the technical session was attended by approximately 60 members and guests.

Plant Tour and Election Feature Annual Meeting

Rockford, Ill.—One hundred and sixty members and friends of Rockford Chapter were guests of the Woodward Governor Co., for their February meeting.

Dinner was served in the company cafeteria following a conducted tour through the Woodward plant, one of the most modern in the Middle West.

Bradford Reed

In a brief business meeting, officers were elected for the 1948-49 season. They are: Howard Nelson, Chairman; Karl Kaiser, First Vice-Chairman; George Rigeman, Second Vice-Chairman; George Torrence, Third Vice-Chairman; Harry Carlberg, Treasurer; and Ernst Norrman, Secretary. Mr. Nelson and Mr. Kaiser were also chosen Delegate and Alternate, respectively.

After the election, the group adjourned to the auditorium to hear W. B. Peirce, Society President, discuss "Tool Engineers and Their Place in Industry."

Mr. Peirce explained also functions and aims of ASTE National committees and impressed the assembly with the Society's growing importance in advancing tool engineering.

Technical speaker of the evening was Bradford Reed, President, Rolled Thread Die Co. His subject was "Thread Rolled Dies."

Mr. Reed traced the history of thread rolling from its known origin to the present time, describing problems overcome to meet present threading standards.

Slides accompanying his talk showed applications of cylindrical thread rolling pioneered by his company.

Ernst Norrman, Woodward Governor engineer, made arrangements for the meeting, under the direction of retiring Chairman Ernest Seborg.

1948-49 Officers Elected

Richmond, Ind.—Annual election of officers was held by Richmond Chapter at a dinner meeting, February 10 in Hotel Leland.

Heading the Chapter for the 1948-49 term are: Ralph McKee of the Crosley Co., Chairman; Howard Haworth, Belden Mfg. Co., First Vice-Chairman; Pierre Perrine of Knowles Tool Company, Second Vice-Chairman; Horace G. Webb, International Harvester Co., Secretary, and Paul Hermansdorfer of the National Automatic Tool Co., Treasurer.

O. T. Hamby, speaker of the evening, was introduced by Lowell Penland, Chapter Chairman. Mr. Hamby, Master Mechanic of the Dodge Div., Chrysler Corp., Detroit, talked on the design and building of Draw Dies. Using sketches and diagrams, he illustrated major points to consider in drawing of materials. A round table discussion followed. Approximately 60 members were present.

Calls Gears Most Complex Machine Element of Today

St. Catharines, Ont.—"Modern Methods of Gear Manufacture" was discussed by B. F. Bregi, Executive Engineer, National Broach and Machine Co., before some 80 members and guests of Niagara District Chapter meeting February 5 in the Queensway Hotel.

Mr. Bregi traced gearing from the stone age to present day mass production. Gears are probably the most complicated and exacting machine element of the modern age, he said, stressing the great advances made through the war years.

Methods of gear cutting, including form milling, hobbing, shaping, grinding, lapping, shaving, and crown shaving, with emphasis on the latter two relatively new forms, were described by the speaker.

Explaining the manufacture, use, and advantages of gear shaving, Mr. Bregi stated that some of the most accurate gears are made by this process.

After some close balloting, the following officers were chosen during the annual election: Chairman, H. F. Gorth, Master Mechanic, Lightning Fastener Co.; First Vice Chairman, N. B. Coleman, Process Engineer, McKinnon Industries; Second Vice Chairman, E. L. Morley, Project Engineer, Lightning Fastener; Secretary, C. R. Mitchell, Assistant Plant Engineer, Imperial Iron Corp., Ltd.; and Treasurer R. A. Watts, Foreman, Thompson Products, Inc.

W. L. Sandham, Past Chairman, was declared Chapter Delegate and E. G. Dewar, Alternate, by acclamation.

Mr. Sandham received a letter of recognition from J. S. Elliot, Director of Vocational Guidance at St. Catharines Collegiate, commending the Chapter on their outstanding contribution to vocational students, in lectures and classes.

Typewriter Production Seen in Plant Visit

Hartford, Conn.—Some 200 members of Hartford Chapter were guests of the Royal Typewriter Co., February 2, for dinner and a tour of the plant.

Chairman Richard Smith presided over the business meeting which followed and conducted the election of officers. Chapter executives chosen for 1948-49 are: Chairman, William Jarvis; First Vice-Chairman, Clayton Parsons; Second Vice-Chairman, Don Huntting; Secretary, Henry Kuryla; and Treasurer, Robert Edmunds.

Mr. Smith, the retiring Chairman, was named Delegate with Mr. Jarvis as Alternate.

The Nominating Committee presenting the slate of candidates was composed of: Edmond Morancey, Chairman; Carl Moeller and Henry Rockwell, all former Chapter Chairmen.

H. E. Conrad, ASTE Executive Secretary from the Detroit office, was a guest at the meeting and spoke concerning the Society's Exposition at Cleveland.

The program concluded with the showing of several sport films.

Ryno, Taft-Peirce Agent

Newark, N. J.—H. Wilson Ryno has been appointed agent for The Taft-Peirce Mfg. Co. in Newark, the company has announced. His territory will include northern New Jersey, New York City, and lower New York State.

Since 1937 Mr. Ryno has operated in the sales field for the Charles L. Jarvis Co. and National Tool Co. He represents also Bendix-Westinghouse Automotive Air Brake Co. and Noble & Stanton, Inc.

For a number of years he has served as N. New Jersey Chapter Secretary.

Says Resistance Welding Cuts Costs, Ups Output

Elmira, N. Y.—"Resistance Welding," the branch of welding in which resistance of work parts to electric current creates the welding heat, was the subject of a lecture given March 1 before Elmira Chapter by William J. Farrell, Assistant to Vice-President, Sciaky Bros., Inc., Chicago.

Beginning with early applications of the process, Mr. Farrell told how intensive research and study have brought welding machines to their present high rates of production. Strides made since the termination of hostilities have already outmoded relatively recent machines, he commented.

The four main classifications, spot, seam, butt, and projection welding, were explained in detail. Materials named as lending themselves successfully to economical resistance welding embrace iron, steel, copper, aluminum and their various alloys.

Lantern slides showing modern high production set ups and diagrams of various layouts illustrated the talk. High production, good welds and low current costs were stressed by the speaker.

A question and answer period following the talk revealed lively interest in the subject.

Dinner and a business meeting preceded the technical session. Newly-elected officers were installed by Past Chairman Dolph Kylor.

The presiding officer, Retiring Chairman Edward Stachel, was awarded a Past Chairman pin. Incoming Chairman James Deegan introduced the speaker.

In conclusion, a film, "Guardians of Gunsight Pass," was presented by Great Northern Railway. The Kodachrome production showed Montana wild life in one of the most beautiful sections of Glacier National Park.

Typewriter assembly is studied by Hartford Tool Engineers making tour of Royal Typewriter Company plant

Coming MEETINGS

CLEVELAND—May 14, East Side Turners. Speaker: B. F. Bregi, Executive Engineer, National Broach and Machine Co. Subject: "Modern Methods of Gear Manufacture."

ERIE—May 4, General Electric Community Center. Speaker: Myron S. Curtis, Assistant Director of Engineering, The Warner & Swasey Co. Subject: "Economic Aspects of Future Machine Tool Design."

FLINT—April 15. Subject: "Resistance Welding," sponsored by Progressive Welder Co.

HAMILTON—May 14, Fischer Hotel. Ladies Night. Program and film sponsored by "Frigidaire."

HARTFORD—May 3. Subject: "Punches and Dies."

LOS ANGELES—October 14-15-16 (tentative dates). ASTE 16th Semi-Annual Meeting.

MILWAUKEE—May 13. Plant tour, dinner and business meeting at Falk Corp.

PITTSBURGH—May 7, Fort Pitt Hotel. Dinner 6:30 P.M.; Meeting 8:00 P.M. Speaker: George F. Hawkins of Heller Brothers Co., Newark, N. J. Subject: "Files on Parade."

TOLEDO—April 14, 7:00 P.M., Toledo Yacht Club. Speaker: H. E. Heywood, Engineer, National Supply Co., Toledo. Subject: "Oil Well Drilling," illustrated with motion pictures. May 12, same hour and place. Speaker from The Lapointe Machine Tool Co. Subject to be announced.

TWIN STATES—April 14, 6:30 P.M., The Fellows Gear Shaper Co. cafeteria. Speaker: J. E. Jones, Supervising Engineer, Cutler-Hammer, Inc., Milwaukee, Wis. Subject: "Black Box Electronics."

First Man-Made Abrasive Produced in Iron Bowl

Elmira, N. Y.—The romance behind the creation of the first manufactured abrasive, its development, and present widespread industrial uses, were narrated by Francis D. Bowman, Director of Public Relations, The Carborundum Co., Niagara Falls, N. Y., while addressing a recent dinner meeting of Elmira Chapter.

In relating the compelling story of inventive genius, Mr. Bowman described how Dr. Edward G. Acheson first made abrasive with the crudest of equipment.

Beginning with a tiny electric furnace fashioned from an iron bowl such as plumbers use to melt lead, the scientist attached one wire from a small electric power plant to an electric arc light carbon in the center of the bowl, charged with clay and powdered coke. The other wire was fastened to the bowl itself.

Silicon Carbide, $880 per Pound

With this simple apparatus, Dr. Acheson extracted the first silicon carbide, later sold to jewelers for 40 cents a carat or $880 per pound, about half the price of diamond dust.

During the past 50 years, results of this discovery have been far-reaching—even revolutionizing many industrial production methods, the speaker declared.

Mr. Bowman's talk was supplemented with a film which took the audience on an interesting sightseeing trip through the Carborundum plant, showing abrasive manufacture in giant electric furnaces to the shipment of the finished product. Other sequences made in plants throughout the country revealed conventional and unusual applications of abrasives, as well as modern grinding methods.

Earlier in the evening Dolph Kylor, George Morceau and Ernest Banks were elected a Nominating Committee.

Chairman Edward Stachel presided and introduced the speaker.

Announcements of Coming Meetings should reach *The Tool Engineer* two months before date of meeting.

Fletcher Shows Advance In Heat Treating Steels

Baltimore, Md.—Technical speaker at the February meeting of Baltimore Chapter was Dr. Stewart G. Fletcher, Chief Metallurgist of Latrobe Electric Steel Co., who discussed modern developments in alloying high speed tool steels for various purposes.

Charts, showing the proper heat treatment of these alloys for optimum performance in application, illustrated Dr. Fletcher's talk.

At the conclusion of the lecture, Ray P. Kells, Chief Service Engineer at Latrobe, conducted an informative question and answer period.

Prior to the technical session, an engineer from the Glenn L. Martin Co. gave a brief resume of the development of airliners for transport use.

Also described by the speaker were engineering studies made to determine the efficiency of cost per ton mile or cost per passenger mile, by weighing such factors as horsepower, take-off speed, runway length and cruising speed.

A color film, depicting the testing of the Martin 202 transport plane, was shown during the evening.

Obituaries—

Carlos H. Allen

Carlos H. Allen, dean of bearing application engineers specializing in automotive design, and for 29 years in the Detroit Office of New Departure, Div. of General Motors, died February 8 at the age of 56.

The happy teaming of attractive personality, sound engineering sense, and a vast background of experience made him both friend and trusted advisor of car and truck engineers generally.

Mr. Allen was a graduate of the University of Michigan with the class of 1914.

Before joining New Departure in 1919, he served with the Army in World War I, and did engineering work for firms in Torrance, Calif., and Chicago.

He was a member of Detroit Chapter, ASTE, and of SAE.

N. E. Maytag

After a sudden seizure of illness at his work, N. E. Maytag, 54, of Pontiac Chapter, ASTE, was rushed to the hospital where he died shortly after admission, December 22.

Born in Laurel, Iowa, Mr. Maytag studied at a technical school in Des Moines and was associated with Denver Rock Drill Co. at Denver, Colo., before joining General Motors Corp. 25 years ago.

Beginning as a toolmaker at East Moline, Ill., he left in 1927, returning a year later as foreman in the Sheet Metal Dept. Transferred in 1930 to the Truck and Coach Div. at Pontiac, Mich., as Assistant Superintendent, he had been in charge of the Tool Div. since 1932.

A charter member of the Society, he was affiliated with Detroit Chapter until the formation of a Chapter at Pontiac, in the organization of which he played a prominent part.

He was also a board member in the Central Methodist Church and Superintendent of the Sunday School, besides participating in many community activities.

The flag at his plant was flown at half-mast the day following his demise.

Charles A. Olson

Charles A. Olson, Tool Superintendent of Gisholt Machine Co., Madison, Wis., passed away recently at the age of 67.

Mr. Olson was a veteran member of the Gisholt staff, having been in the company's employ for 40 years.

He was also a charter member and active worker in Madison Chapter, ASTE.

Frank A. Mette

Frank A. Mette, Tool Designer at Carter Carburetor Co., St. Louis, Mo., died December 21, two days after his 48th birthday.

A native of Nashville, Tenn., he attended Rankin College, majoring in mechanical drafting.

From 1926-41 he served as Tool and Die Designer at Century Electric Co., St. Louis.

For nearly 10 years, he had been a member of St. Louis Chapter, ASTE.

In recent election Los Angeles Chapter gave most of its officers a second term. From left, standing: A. J. Lewis, Alternate; Anton Peck, Delegate; L. F. Hawes, Chairman; and Harvey Groehn, First Vice-Chairman. Seated: G. J. Walkey, Second Vice-Chairman; Rudolph Powroznik, Treasurer; and Joseph A. Parks, Secretary. Inset: W. C. Robinette, election night technical speaker, describes Servomechanisms. Right: Part of group enjoying entertainment at stag party held lately in Barney Oldfield's Country Club

Show Robot Machine Models in Varied Applications

Los Angeles, Calif.—Using an extensive exhibit of running models, W. C. Robinette, and Lawrence Pugh, Chief Engineer, of the W. C. Robinette Co., demonstrated to Los Angeles members what their "George Robot" can do.

Discussing Servomechanisms before the Chapter February 12, the speakers showed that accuracy of response lies in the order of micro-inches, though force required might be measured in micrograms.

Source of power for all models was a common two-phase squirrel cage induction motor of 1/15 hp. The models demonstrated a motron unit tracking an endless paper ribbon within .004 in. deviation of its true path, or controlling the mixing of oils of high and low viscosity to a blend of any desired intermediate viscosity, and many other applications.

An impressive demonstration of marksmanship was given by a pistol team from the Los Angeles Police Dept. Emulating William Tell, they shot successively ashes, embers, and band from a cigar being smoked by one of the squad, and gave other thrilling performances of trick and precision shooting.

Results of the annual election of officers, held during the meeting, are: Leslie F. Hawes, re-elected Chairman; Harvey Groehn, First Vice-Chairman; G. J. Walkey, re-elected Second Vice-Chairman; Joseph A. Parks, Secretary, re-elected for third term; Rudolph Powroznik re-elected Treasurer.

Anton Peck was re-elected Delegate, and Arthur Lewis is Alternate.

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The previous gathering of the group was a stag dinner party and entertainment at Barney Oldfield's Country Club.

Ten Ways to Kill Your Chapter

1. **Don't come to the meetings.**
2. **If you do come, come late.**
3. **If the weather doesn't suit you, don't think of coming.**
4. **If you do attend a meeting, find fault with the work of the officers and other members.**
5. **Never accept office, as it is easier to criticize than to do things.**
6. **Nevertheless, get sore if you are not appointed on the committee, but if you are, do not attend committee meetings.**
7. **If asked by the chairman to give your opinion on some matter, tell him you have nothing to say. After the meeting, tell everyone how things ought to be done.**
8. **Do nothing more than is absolutely necessary, but when members roll up their sleeves and willingly, unselfishly use their ability to help matters along, howl that the branch is run by a clique.**
9. **Hold back your dues as long as possible, or don't pay at all.**
10. **Don't bother about getting new members. "Let George do it."**

Canadian Group Presents Member Night Program

Hamilton, Ont.—Members contributed the entire speaking program and entertainment at a meeting of Hamilton Chapter, February 13, in the Brant Hotel, Brantford.

From George Ryckman, the group learned something of production tooling for a relatively new local industry. Experienced in designing special machines for the ceramic industry, Mr. Ryckman showed motion pictures of his automatic transfer decorating and stencilling machine.

Another film, produced by Hamilton Potteries, Ltd., depicted manufacturing operations for the varied types of pottery and china made in this plant. It was apparent that Mr. Ryckman's machines were an important factor in putting the industry on a production basis.

The speaker heads Ryckman Machine Co., Ltd., one of three such firms engaged in building equipment for making ceramics.

Earlier speakers were W. M. Shaw, Machine and Tool Designer, Callander Foundry & Mfg. Co., Ltd., Guelph; and W. D. Kincaid, Service and Tool Engineer, B. F. Sturtevant Co. of Canada, Ltd., Galt.

Difficulties encountered in tooling and jigging for a new line of woodworking tools were described at some length by Mr. Shaw.

Mr. Kincaid explained in detail the recent installation of air conditioning equipment in a large Toronto Hotel. J. Johnson of Galt introduced the speakers.

Another member, Sidney Dunn, Manufacturing Superintendent, Massey-Harris, Ltd., Brantford, rendered piano solos.

Chairman W. A. Alexander conducted the business meeting and election of officers. Gordon Hall was chosen Chairman, George Gilmour, First Vice-Chairman, and W. A. Patterson, Second Vice-Chairman.

Harry Cort was named to fill the newly-created office of Third Vice-Chairman, and W. S. Werthmiller was voted in as Secretary, with R. T. Vincent re-elected Treasurer.

GOOD READING

A Guide to Significant Books and Pamphlets of Interest to Tool Engineers

TOOL STEEL SIMPLIFIED, a 564-page handbook, offers tool and die makers an authoritative source of information on tool steels and their heat treatment. These two essentials plus proper design and accurate tool making constitute the formula for a *good tool*.

The authors, **Frank R. Palmer**, Vice-President, and **George V. Luerssen**, Ch'f Metallurgist, of The Carpenter Steel Co., have recognized that every bit of knowledge contributive to good tools should be concentrated in one head—that of the tool maker. "Tool Steel Simplified" is the result—an easy-to-read summation of what the steel expert knows, to assist the tool maker in selecting the right steel and its heat treatment.

Accelerated by the influence of the war, tool steels and the methods employed in their heat treatment are in a period of rapid development. Included in the present edition are the newer concepts of hardenability; latest advances in heat treating equipment, methods, and testing; latest hardenability tests; best present knowledge of atmosphere control and quenching. Three new chapters have been added—the very useful Tool Steel Selector, Time Required to Heat Tool Steel, and High Speed and Hot Work Steel.

The tool maker and the hardener are thus provided with the latest information on tool steels, in the most concise, accurate, and understandable form. This volume is available from the publishers, **The Carpenter Steel Co.**, Reading, Pa., at $2.00 per copy in the United States, or $2.50 elsewhere.

DoALL CONTOUR SAWS, now in its 12th edition, has been revised and enlarged to 416 pages in order to include a new section (about 150 pages) on instruction programs for use in shop or school training programs.

The book describes—through photographs, charts, and drawings—the techniques for contour sawing and filing, also high speed sawing and the friction cutting methods using band sawing equipment. Comparison is drawn between the performance of these machines and that of other basic machine tools.

The factual information and training outline will appeal to plant managers, engineers, tool room foremen, and to others concerned with machining methods, time and cost studies, or training.

The book is available free of charge, provided evidence is given that book is intended to be used advantageously for training purposes. Write to *The DoALL Company*, 254 No. Laurel Ave., Des Plaines, Ill.

FUNDAMENTALS OF PRESSURE AND TEMPERATURE INSTRUMENTS and its companion work **INSTRUMENTS AND PROCESS CONTROL** together furnish an unusual background of technical information requisite to a complete understanding of pressure and temperature instruments and their application in the control of manufacturing processes.

The first text is divided into two parts—Information Sheets and Laboratory Units. The Information Sheets provide related technical information for class, laboratory, or home study. In introduction of instrument technology, they cover explanations of physical and chemical laws affecting pressure and temperature measuring and recording instruments; descriptions of the manufacture, operation, and maintenance of these instruments and accessories; and their application in process control.

The Laboratory Units, thirty-one in number, constitute practical application of the theories expressed in the first section. Each topic is presented by an Objective, Introductory Information, a List of Equipment and Materials needed to conduct the experiment, step-by-step Laboratory Procedures, and tabulated Result forms for accurately recording laboratory data.

The second volume, "Instruments and Process Control", was prepared in the Curriculum Laboratory at Cornell University, under the direction of **Lynn A. Emerson** and in cooperation with the Taylor Instrument Companies.

In this volume are included seventeen Information Sheets, providing information on Industrial Processes in general; Basic Control Theories; Basic Controller Mechanisms; Pneumatic Mechanisms Incorporating Control Effects; Industrial Controller Applications; Specialized Controller Applications; Applications on Fractioning Columns, Heat Exchangers, and Industrial Air Conditioning; and other subjects. Also included is a wealth of information on the installation, testing, and maintenance of controllers. Appended information includes a Glossary of Proposed Terminology, and an explanation of Advanced Control Theory.

Both volumes are profusely illustrated with graphs, drawings, and photographs, many of them cutaway views of actual instrument mechanisms. While prepared in monograph form, the books are cloth-bound board for rigidity and permanency.

"Fundamentals of Pressure and Temperature Control" and "Instruments and Process Control" are available from *Delmar Publishers, Inc.*, Orange Street and Broadway, Albany 7, N. Y.

PLASTICS DICTIONARY, by ASTEer **Thomas A. Dickinson**, will provide expert and layman alike with understandable definitions of more than 3500 terms most commonly used with reference to plastics. Also included are numerous charts and tables providing graphic data on fillers, catalysts, chemical elements, pigments, and other items.

Enough base words and combining forms are included to enable the user to understand many uncommon plastics terms that may not yet have been defined. In many instances, drawings and diagrams are used to explain fully the exact meaning of certain terms.

A 312-page volume, this valuable contribution to plastics literature may be had at $5.00 per copy from **Pitman Publishing Corp'n**, 2 West 45th St., New York 19.

LESSONS IN ARC WELDING, third edition, compiled by **The Lincoln Electric Company**, Cleveland, Ohio, has been so completely revised as to compose almost an entirely new book. For experienced as well as new welders, the revised work includes complete and thorough instructions in many phases of arc welding, and particularly on the use of recently developed electrodes.

In addition to fundamental lessons in arc welding, a wealth of new information is incorporated—new procedures covering use of large electrodes, lessons on pipe welding, a complete discussion of distortion with recommendations on its prevention and control, and hard-facing principles and applications.

This 158-page pocket size book is available from *The Lincoln Electric Company*, Cleveland 1, Ohio, at $.50 per copy, postpaid, in United States, and $.75 elsewhere.

Recently arrived from England is **A PRACTICAL THEORY OF MECHANISMS**, by **Paul Grodzinski**. This 166-page book of handy pocket size is devoted to a classification and description of mechanisms applicable to machines and instruments, and illustrated by schematic line drawings. While most mechanisms mentioned are not fully described, it is the author's intention to be brief in order to show the relationship of the various types and forms of mechanism.

Contents cover Chains of Links and Element Pairs, Screw Mechanisms, Four Bar Link and Derived Mechanisms, Cam Mechanisms, Gear Trains, Belt and Fluid Drives, and Ratchets. Publishers are *Emmott & Company, Ltd.*, 31 King Street West, Manchester 3, England. Cost of the book is 7S. 6D. (approx. $1.52).

THE TOOL ENGINEER

INDEX

Volume XVII, August 1946 to January 1947

Author Index

Subject Index

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

V

W

North East South West
IN INDUSTRY

The Small Lot Stamping Co. has been established in Linden, N. J. by **K. Peterson**, and will specialize in short runs of custom-made stampings from steel, brass, copper, aluminum, bronze, and associated materials.

The **Machinery Mfg. Div'n** of **Milwaukee Chaplet & Mfg. Co.**, Milwaukee, will henceforth be known as the **Rice Pump & Machine Co.**, although continuing to operate as a division of the parent company.

Federal Products Corp'n, Providence, R. I., has purchased all rights and equipment for the manufacture of the electronic circuits used in the Electronic Comparator and Sortron-Matic Automatic Sorting Gages formerly offered by **Foote, Pierson & Co., Inc.** Federal manufactures a wide range of Electronic Gaging Equipment such as comparators and dimensional sorting gages.

Clayton R. Burt has resigned as Chr. of the Board of **Niles-Bement-Pond Co.**, West Hartford, Conn., in order to accept the presidency of the newly-formed **Potter & Johnston Co.**, which will be operated as a subsidiary of Niles-Bement-Pond. The latter organization, through its Pratt & Whitney Div'n, has purchased the good will, patents, patterns, jigs, fixtures, drawings, and all work in process from **Potter & Johnston Machine Co.**, Pawtucket, R. I., hereafter to be known as **Darlington Industrial Corp'n.** Operations will continue at Pawtucket, the plant and manufacturing equipment having been leased from the Darlington organization.

Pyro Plastic Corp'n, which has had a phenomenal growth since its formation nine years ago by **William M. Lester**, has recently moved its factory facilities and offices from Westfield, N. J., to a new plant, offering much larger and more adequate quarters, in Union, N. J. This firm has a wide range of activities but specializes in the custom injection molding of plastics.

The Autostart line of Grinders and Buffers, manufactured by **U. S. Electrical Motors, Inc.** for 28 years, will now be manufactured and marketed by **Globe Products Mfg. Co.**, Los Angeles, using U. S. motors exclusively.

The **Gray Iron Founders' Society** is well underway with their program of organizing 40 area management groups throughout the country. Meetings have already been held in a large number of localities, and the groups formally organized.

Stanley M. Cooper has been elected Pres. of **The Fafnir Bearing Co.**, New Britain, Conn., succeeding **Maurice Stanley**, who becomes Chairman of the Board. Mr. Cooper has held many executive positions with Fafnir since joining the organization in 1924.

Jan M. Krol, consultant in foundry practice and development engineer in hot-pressing and vacuum techniques for the cemented carbide field, and **Robert Lane Pettibone**, specialist in the heat treatment of powder metal parts, have become affiliated with **Sintercast Corp'n of America**, New York, as Ch'f Metallurgical Eng'r and Research Metallurgist, respectively.

Robert H. McGrath, formerly Vice-Pres. and Gen'l Mgr. of **Jos. Dyson & Sons, Inc.**, forging mfrs., has been appointed Ass't to the Gen'l Mgr. of the Nat'l Machine Tool Builders' Ass'n.

Ronald S. Drysdale, widely recognized as an authority on cutting oils, has resigned from his staff position with **Sun Oil Company**, Philadelphia, but will continue to serve Sun as a special consultant and will undertake a series of experiments with cutting oils at the company's Marcus Hook refinery.

Howard Ledeen has been appointed to head all sales of Ledeen Heavy Duty Cylinders for the manufacturer, **Engineering Products Co.**, Los Angeles. Mr. Ledeen, who figured in the original development and design of these actuating cylinders, will also be concerned with special engineering developments as well as sales.

A. L. Gutterson, J. B. Johnson, and **C. N. Safford** were recently elected Directors of **Lovejoy Tool Co., Inc.**, Springfield, Vt. C. N. Safford was also elected Pres. and C. E. Hopkins, Treas.

Albert J. Fischer, formerly associated with the Carbide Div'n of the Firth Sterling Steel & Carbide Corp'n, has been appointed to head the Product Research and Development Lab. of the **Adamas Carbide Corp'n.**

A. J. McLaren, formerly a partner of Mechanical Tool Eng'g Co., New York, is the recently appointed Sales Engineer in Ohio for the Cross Company, Detroit mfrs. of special machine tools.

Charles P. Collins has resigned as Sec'y and Gen'l Counsel of SKF Industries to accept the presidency and Membership on the board of the **Norma-Hoffman Bearings Corp'n**, Stamford, Conn.

Progressive Welder Co. has greatly expanded its West Coast facilities at Los Angeles. The new plant at 1161 East Florence Ave. includes assembly and service facilities for the various types of Progressive welding machines, a very complete stock of parts and accessories, and manufacturing facilities for special parts.

Recent appointments made by **Allegheny Ludlum Steel Corp'n**, Pittsburgh, include **R. J. Bryan** as Plant Mgr. of the Buffalo Foundry; **Dr. P. K. Koh**, Assoc. Dir. of Research in charge of tool and die steel and allied products; **George I. Boettcher**, Ass't Ch'f Eng'r; and C. M. Binney, Ass't. Dist. Mgr. of the New York Sales District.

George E. Grimshaw has retired as manager of the industrial insulation dept., **Johns-Manville Corp'n**, and will establish New York offices as consultant on industrial insulation, specializing in the oil, steel, and chemical industries.

Frank M. Mason, since 1943 in charge of the **U. S. Electrical Motors'** plant at Milford, Conn., has been appointed Vice-Pres. He will retain his headquarters at the U. S. Atlantic plant at Milford.

William J. Priestly, Vice-Pres. in charge of the **Alloys and Metals Div'n**, has been elected as a Director of the **Union Carbide and Carbon Corp'n**, New York.

COMING EVENTS

April 19-21. THE AMERICAN SOCIETY OF LUBRICATION ENGINEERS. Third Annual Convention and Exhibit. Hotel Statler, Buffalo, N. Y.

April 22-23. MACHINE TOOL ELECTRIFICATION FORUM, sponsored by Control Div'n, Westinghouse Electric Corp'n, Hotel Statler, Buffalo, N. Y.

April 26-30. 17th ANNUAL PACKAGING EXPOSITION AND CONFERENCE, sponsored by American Management Ass'n. Public Auditorium, Cleveland.

May 1-17. 37th PARIS TRADE FAIR. Paris, France.

May 3-7. AMERICAN FOUNDRYMEN'S ASS'N, 1948 Congress and Show. Convention Hall, Philadelphia.

May 3-14. BRITISH INDUSTRIAL FAIR. Birmingham and London, England.

May 8-17. ZAGREB INTERNATIONAL FAIR. Zagreb, Yugoslavia.

May 31-June 12. INTERNATIONAL TRADE FAIR. Toronto, Canada.

June 6-11. SPECIAL LIBRARIES ASS'N, 39th Annual Convention. Hotel Statler, Washington, D. C.

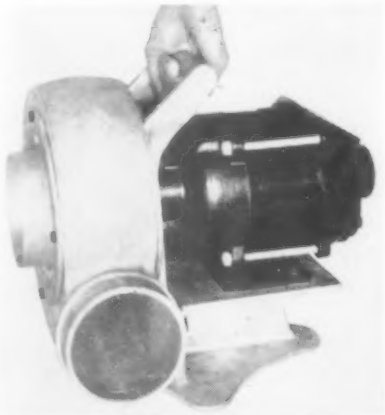
June 21-25. AMERICAN SOCIETY FOR TESTING MATERIALS. Annual Meeting and Exhibit. Detroit.

June 26-Sept. 11. INTERNATIONAL INDUSTRIAL EXPOSITION. Million Dollar Pier, Atlantic City.

June 28-July 1. ANNUAL INDUSTRIAL FINISHING EXPOSITION AND CONVENTION, sponsored by American Electroplaters' Society. Convention Hall and Ambassador Hotel, Atlantic City.

TOOLS OF TODAY

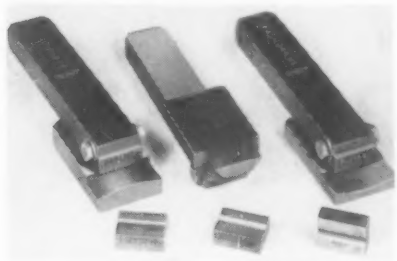
Portable Ventilator



Called **"Saf-T-Air,"** a new electric motor driven **Ventilator**, with a capacity of 425 cubic feet of air per minute, and announced by United Electric Motor Company, can be used either as a blower or exhauster. It is designed to provide air and ventilation in close quarters, and serves to eliminate hazardous gases and fumes which would ordinarily endanger men working in confined spaces. **T-4-1**

Locating Guide for Stamps

A new line of "locating guide" stamping devices for annular marking, developed by New Method Steel Stamps, Inc., permits parts like gears, sleeves, tubing and bushings to be easily and accurately hand stamped around a flat radius with such "standard" information as heat treat codes, batch and part numbers.



The new **Annular Marker** consists of a holder, a replaceable solid logotype bearing the desired characters, a clamping pin, and the locating guide. These locating guides are arranged for marking either from the O.D. or the I.D.

T-4-2

"Thermo-Tip" Thermocouple

Designed for general foundry use, and interchangeable with existing equipment, a new line of **Thermocouples**, by the Industrial Instrument Service Company, may be had in one piece and in practically any length or shape. And because the increased length brings the connecting junction outside the retort, previous difficulties with burned handles and frozen set screws are largely eliminated.

These **"Thermo-Tips"** which use 16 gauge matched chromel-alum elelements are available as standard in 18" and 24" lengths, either straight (as shown) or with 45° and 90° bends. Shorter lengths may be had; also, where extreme sensitivity and rapid temperature indication is required, matched thermocouples of 20 gauge wire can be supplied to order.

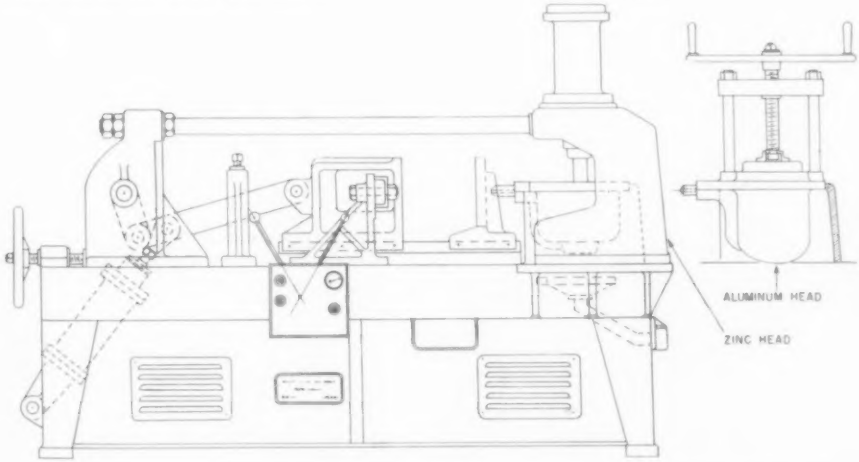
T-4-4

New Die Casting Machine

A new model **Die Casting Machine**—the "Two-pounder"—announced by DCMT Sales Corporation, has capacity of 2 lbs. on zinc and 1 lb. on aluminum, on 12 " x 18" standard die blocks. With this machine, which is better shown in line drawing than by photograph, aluminum can be cast as rapidly as zinc, production rate for each metal being about 350 shots per hour.

A feature of the machine is that change-over from zinc to aluminum can be made without use of hand ladle for each shot of aluminum. Another advantage is that the machine is completely pneumatically operated, with control from one toggle switch. The die carrier slides on dove-tail ways and, since there are no tie bars through the die blocks, all four sides are open for core pulls or placement of inserts.

T-4-3

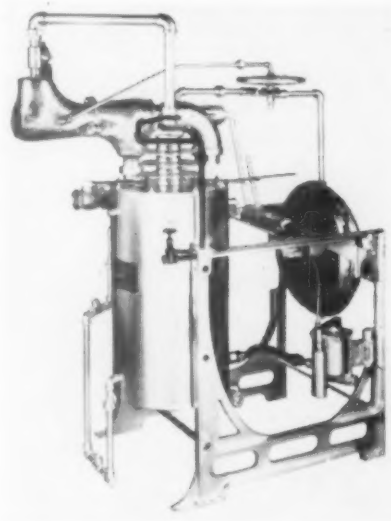


Low-Cost Gas Generator

Extensively used as a "Standby" because of its quick switchover to gas without interruption of flame or change of flame quality, an improved Vapofier, by Vapofier Corporation, provides safe, low-cost gas from fuel oil for all types of industrial ovens and furnaces.

Mounted on an aluminum chassis, the improved Vapofier features fewer parts in perfect alignment and automatic constant pressure and air-gas ratios from a reducting to an oxidizing flame.

T-4-5



For Further Information on Any Tool of Today, Use Inquiry Form Facing Pages 80-81

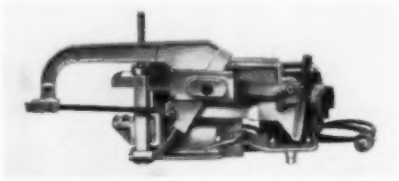
Air-Hydraulic Presses

Two new presses, announced by Air-Hydraulics, Inc., include a 10-ton foot operated hydraulic **Arbor Press** and a small **Air-hydraulic Press**, of 1200 lbs. capacity, the latter added to the 2½ and 6 ton models. Designed with a 6″ throat, 2½″ stroke, the small press is suited for assembling, riveting, broaching and other work which can be advantageously performed as a small, inexpensive tool.

Pressure, in the **Arbor Press**, is entirely hydraulic and controlled by a foot-pump unit. Each stroke of the fast-speed center pedal moves the ram ⅞″ down to work, while the right—or power pump—pedal moves the ram 1/16″ per stroke. A touch of the left hand pedal returns the ram to original position. The pump will deliver pressure up to 20,000 lbs. **T-4-6**

Portable Power Hack Saw

A light weight portable power Hack Sawing Machine—the Hand-I-Hack, by Lipe-Rollway Corporation—is designed to do the many very fatiguing metal sawing jobs usually done manually. Easily carried to the job with one hand and operated from any 110-volt, AC outlet, it will be found particularly useful for the many small sawing jobs in die making and fixture work, and should be ideal for small machine, model and homecraft shops.



The vise, with work holding vise capacity of 3″ × 3″, is swivel mounted and calibrated for cutting accurate mitres. Sawing can be done in any position. The vise can be clamped to work such as a vertical pipe or tangent brace and cut it off at right angle. It will even cut upward. **T-4-7**

Masonry Drill Kit

A handy kit of Masonry Drills, consisting of the six most commonly used sizes—3/16″, ¼″, 5/16″, ⅜″, ½″ and ⅝″—is now offered by the Metro Tool & Gage Company. The kit, packed in a sturdy leatherette case, comes complete with opening instructions. **T-4-8**

Combination Tool Set

A new combination Tool Set, by the Davis Boring Tool Div'n of Gidding & Lewis Machine Tool Co., is designed to meet common machining needs and to end repeated trips to the tool room for different boring tools and setup accessories. Thus, the machine operator does not lose time in selecting the right cutter or in searching for needed work holding accessories.

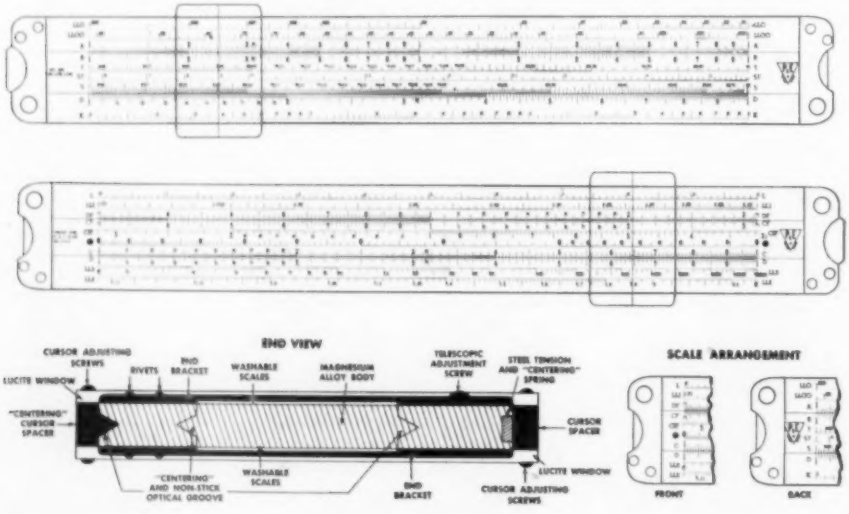
This tool assembly is especially useful on horizontal and vertical boring machines since, in a typical set, there are seven different sized super micrometer boring tools that have an infinite cutting range in diameters from 1¼″ to 7″; also, for boring large and small holes, a micrometer graduated boring and facing head with working range from 0 to 13″.

Not only have the cutting tools been carefully determined to meet most boring requirements, but also setup accessories have been chosen to speed mounting of the work. Readily available, for immediate use, are four precision hardened and ground parallel blocks, four adjustable stop jacks and four hardened and ground stop and jacks blocks. **T-4-10**

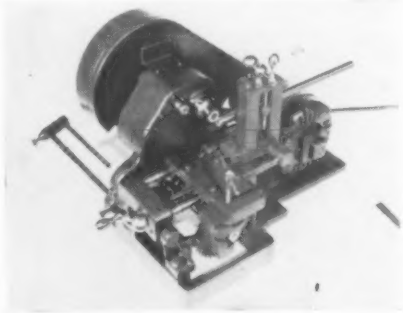
Climate-Proof Slide Rule

What is said to be climate-proof, plastic-covered magnesium-alloy replaces wood in the Ortho-Phase Log Log Slide Rule announced by Pickett & Eckel, Inc. This material is claimed to afford six advantages not possible in wooden rules before: Enduring accuracy under all conditions through use of non-warping, all-metal construction; precision manufacture to .001-inch tolerance; cursor window kept away from scale surface by cursor "centering-groove" and spring channel; precision-made adjusting screws that afford easy, accurate "line-up" of scales on body and slider; optical groove "centers" slider, which makes hairline settings easy; and non-face scales unaffected by grease, oil, industrial handling or constant cleaning.

The new rule bears standard Log Log scales, is 12⅛″ × 1½″ × ⅛″, and weighs 4 ounces. It comes complete in cardboard box with felt carrying case and illustrated instruction manual written by Prof. M. L. Hartung, University of Chicago. **T-4-9**



Versatile Milling Machine



A newly developed combination Milling Machine, by the Hyland Machine Company, is a small, practical tool for large or small shops, designed to save setup time on short run, high speed jobs. The tool provides two speeds for fast, accurate cut-off of mild steel or brass, high carbon alloy or tool steels of any length. An adjustable stop may be set to cut lengths up to 15″ or longer. The machine handles bar stock up to 1″ diameter and mills flats, tangs, squares, Woodruff key slots and keyways. **T-4-11**

New Whippet Hoists

A new line of **Electric Hoists**, by the Ford Chain Block Division of American Chain & Cable Co., Inc., is designed to meet the demands of modern high speed production. Named the "Whippet" and available in capacities from ¼ to 1 ton, the hoists can be furnished with trolleys, either parallel or cross mounted and, in addition, with hook suspension for rigid or bolt suspension.

Standard lift is 12 ft., although 20 ft. lift can be furnished when specified. Preformed wire rope, running in a grooved pulley, provides safety with long wear, and pull chain and handle, which supports the push button station, is used to pull loaded or unloaded hoists along runway beams. **T-4-12**

New Vinyl Base Cement

Plastics, wood, metal, rubber, leather, glass and ceramic ware can now be easily adhered to themselves or to each other by a versatile and powerful vinyl base Cement developed by the Schwartz Chemical Company.

Called Rez-N-Glue and quite colorless, this adhesive should be of considerable interest to the industrial world inasmuch as it is said to dry fast (but not too fast for handling large pieces), requires but one application, and has good "wet grab" qualities. **T-4-13**

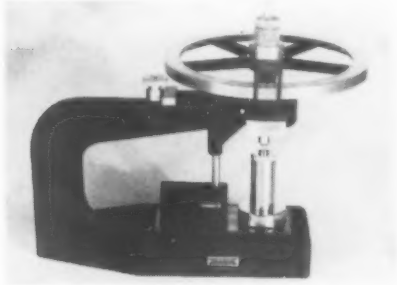
A Correction

Under title "Expanding Key-Type Arbor" (Austin Tool Works, T-3-5, Tools of Today, March The Tool Engineer), it was stated that the tool "serves . . . dual function of cutter (hole) arbor," also, that the arbor "has operated for six minutes." The item should have read: "Serves the dual function of a work arbor and a cutter (hob) arbor; and the tool has operated for six months under a variety of speeds and feeds." While we regret the error, we are glad to print the correction.

The Editors

New Measuring Machine

Among the many improvements which have been incorporated in a new 0-3" Light Wave Micrometer, by the Van Keuren Company, are a specially designed ½"-40 thread heavy duty precision micrometer head, an 8" diameter micrometer wheel with .0001" graduations, a Vernier index which reads to .00001", an enclosed light wave pressure indicator, an index lock, a non parallax glass index, larger diameter spacer blocks, a heavier sub anvil, removable and self aligning carboloy anvil and spindle contacts and a much heavier and sturdier frame.

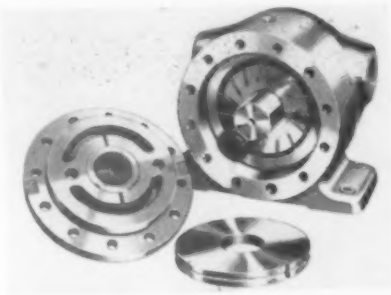


The new micrometer is said to represent the most advanced design of measuring instrument having the proven fundamental principles of the original light wave micrometer which was developed in 1932. These fundamentals are:—a vertically mounted precision micrometer screw operating without backlash in a spring tension nut, and an extremely sensitive light wave pressure indicator which accurately records the exact pressure of measurement.

With its calibration chart showing the accuracy of the screw, the 0-3" instrument is a portable measuring machine which, it is claimed, will give measurements accurate to .00001" without gage blocks or other reference standards.

T-4-14

New Hydraulic Pump



Designed for use in limited space, a new Adjustable Volume Vane Type **Oil Hydraulic Pump** — Model J — by Racine Tool and Machine Company, can be installed in an area as small as 6" x 6". Volumetric output, with efficiency 90% at 1000 P. S. I., is controlled by mechanical movement of the rotor ring, and horsepower requirements can be computed for any given installation according to volume and pressure required. **T-4-15**

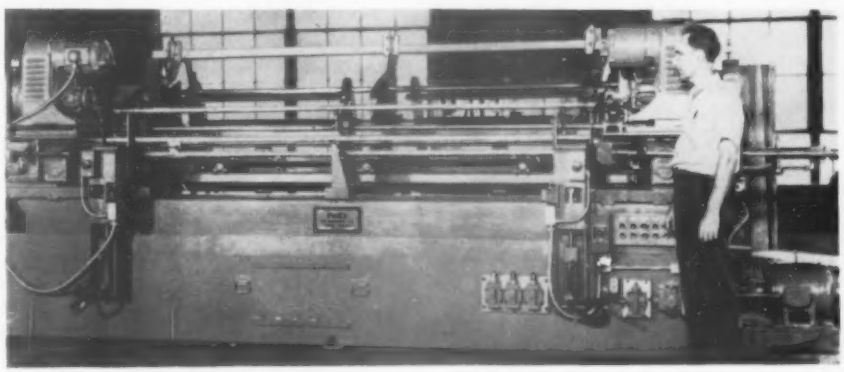
Drill for Hardened Steel

A new **Carbide Tipped Drill** especially designed to drill holes in hardened parts is announced by Super Tool Company, Detroit. While the maker suggests that a certain care must be exercised in its use—as, for example, that it be kept sharp and fed by hand—practical tests have shown that it can be advantageously used even on deep holes regardless of Rockwell hardness; also, it can be used either dry or with coolant, and is now available in 10 sizes from 1/8" to ¾". **T-4-16**

Automatic Profiling Machine

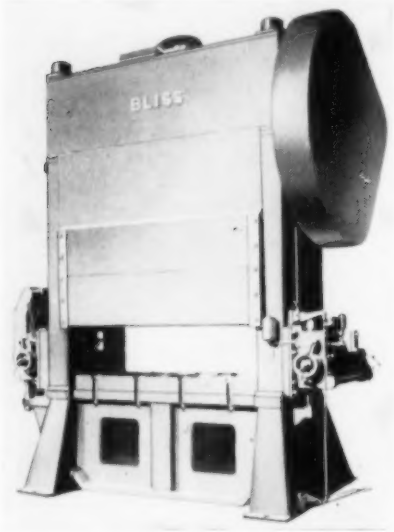
A general duty, automatic **Profiling Machine** for high-production end machining operations, by the Pines Engineering Co., is designed for turning, boring, chamfering, threading, tapping and other operations on the ends of bars, pipes, tubing and fittings. On a double-end chamfering job, for example, output claimed is 800 to 1000 pieces per hour.

The machines are built for either manual or fully automatic operation, and with one or two heads, as desired. They may also be had in sizes to suit work from 1 inch to 60 feet or over, and may be further provided with conveyors to carry the work to and from the machine. **T-4-17**



High-Production 300-Ton Press

E. W. Bliss Company announces the development of the largest of its No. 600 Series of high production Presses. The new unit—No. 6290-D—is a 300-ton press used to form floor panel reinforcements in eight steps of a progressive die, and is completely automatic with double roll feed, of Bliss design, and screap shear synchronized so as to feed and trim predetermined lengths.



Superficial specifications and dimensions for the new press are as follows: Frame construction if of stress relieved, steel weldments with bed, uprights and crown held together by four pre-shrunk steel tie rods. Press bed arranged to receive die cushions. The press has single gearing with single end drive, with air friction clutch furnished with controls by electric push button. Herringbone gears run in oil, and lubrication is by automatic force feed.

Strokes per minute, 30 to 45; distance between uprights, to clear, 84"; stroke of slide, 6"; slide area, 32" F & B × 77" R & L; die space from bed, 23½"; from top of bolster, 17"; bed area, 42" F & B × 84" R & L. **T-4-18**

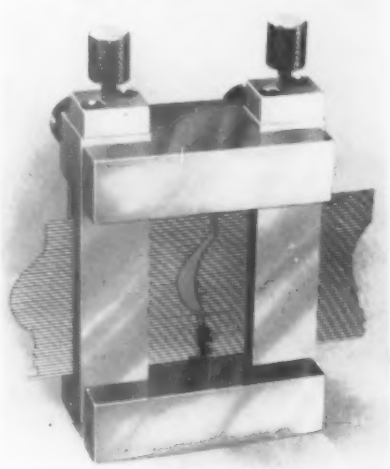
New Carbide Reamer Line

A new line of carbide tipped Reamers, announced by Super Tool Company and known as the "Ream-Rite", is now available from stock in sizes ¼" to ⅝". While not incorporating all the features of Super's standard carbide tipped reamers, the new line—which is lower priced—offers the same superior finish and long wear that is customarily obtained with carbide.

These reamers are not designed for line reaming setups, but for automatic and hand screw machines and work that does not require a long flute to operate thorugh bushings. **T-4-19**

Contour Transfer Gage

A simple, inexpensive contour Transfer Gage, offered by Thompson Products, Inc. through its Accessories and Parts Division, can readily be used for the measurements of any radius or contour where other standard measuring devices are not applicable. It can be applied, with equal facility and accuracy, both to checking die cavity contours and production line parts.



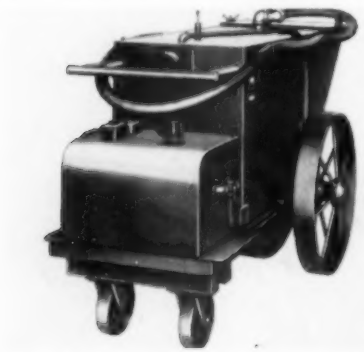
Essentially, the gage provides means for reproducing many curves, ordinarily difficult to gage directly, in a readily measurable form. In conjunction with an optical comparator, the gage permits a rapid, simple setup for checking dimensions. A dial indicator or height gage can readily be used if desired. All pins in the gage are sized within .0002", making it possible to check contours directly on the comparator by using the opposite end of the pins.

T-4-20

For the Tool Engineer's Service Bureau see pages 80-81.

Improved Sump Cleaner

A redesigned Sump Cleaner, by Honan-Crane Corporation, removes chips, grindings, cutting oil or soluble coolant from machine tool sumps; or scale and other contamination from quench and settling tanks, with marked efficiency and maximum time saving.



The unit will transfer oil or coolant from sump to tank by vacuum, without contaminated liquids passing through the pump, and will transfer liquids from below floor level to a maximum of 20 feet.

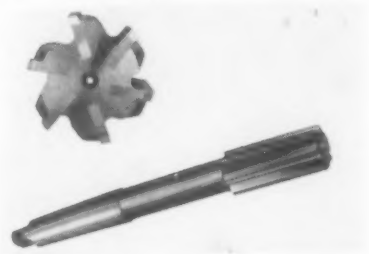
A three-way valve instantly changes suction to pressure, permitting the unit to be used for dispensing clean liquids as well as removing dirty liquids. A mercury contact switch automatically cuts out motor and pump units when the tank is filled. Two sizes are available, either 80 or 125 gallons capacity.

T-4-21

Diemaker's Tryout Press

A new Tryout Press for diemakers, by the General Manufacturing Company, provides a convenient means to try out all dies within the range of the press. Provided with a heavy, large diameter hand wheel in combination with a high lead thread on the ram, the punch may be moved in and out of the die at the rate of 1.6" per revolution. By whirling the wheel, 60,000 pounds percussion pressure is available for test pieces after the die is complete. For bench or stand mounting. **T-4-22**

New High Speed Reamers



U. S. Tool & Mfg. Company announces a new process for making standard and special Reamers where the cutting blades are high speed steel. The blades are firmly imbedded in recesses of low cost carbon steel and secured by a rolling process which obviates welding or brazing. Thus, there is no deterioration of temper and durability of cutter blades. Worn and undersized reamers may be re-rolled, at the factory, to restore the original diameter to precisions limits. **T-4-23**

New Induction Heaters

Designed to eliminate waste caused by attempting to forge bars that have cooled too much during preliminary operations, a new Ajax-Northrup Induction Heater, by Ajax Electrothermic Corporation, speedily reheats the piece the few hundred degrees required to bring it back to the proper forging temperature. Self-contained and foot switch controlled, and located right at the forging machine, it turns out one bar every 60 seconds; timed right to the forging operation.

The cooled bars are fed onto rollers to the high frequency induction furnace where they are reheated on an automatically timed heating cycle to emerge at the exact forging temperature desired. Rejects, once a serious problem, are now almost completely eliminated, and forging has been speeded up.

The unit illustrated is sized for 4-inch bars, and has twin heating coils, each of which draws 125 KW of 960 cycle power. Power source is a 700 KW, 960 cycle, 400 volt motor generator unit which supplies power for two twin heaters, or four work stations. **T-4-24**

Variable Pitch Pulley

Horsepower ratings from $\frac{1}{8}$ to $7\frac{1}{2}$ are now available in the Roto-Cone Variable Pitch Pulley, by Gerbing Manufacturing Corporation. All sizes are constructed to the company's new design which employs a double rack and pinion to keep movement of the two sheave faces equal and opposite at all times. A single spring provides the necessary pressure for proper belt tension.

The new design maintains a constant belt centerline, allowing use of a V-groove driven sheave; also, electronic balancing of the complete unit, after assembly, eliminates noise and chatter. Mounting may be either vertical or horizontal. All sizes deliver infinite speed variations within a 3 to 1 ratio (except the $\frac{1}{8}$ horsepower which is $2\frac{1}{4}$ to 1). **T-4-25**

New Wheel Dresser

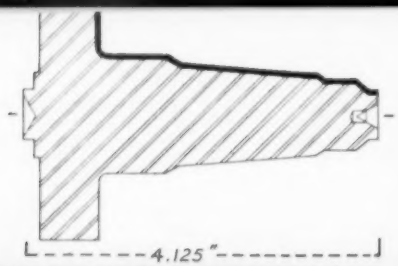
A new contour Wheel Dresser, by the Hoglund Engineering Company, Inc., is a high precision tool said to permit rapid dressing to .002" accuracy. Operating on a new application of hydraulic principles and employing templates which reduce all contour error in a ratio of 1 in 10, about the only limitations of the contour to size or shape is the size of the diamond used for dressing. That is, if the contour can be entered with a diamond, it can be dressed; for example, a diamond with a .002" radius permits concave radii of .002" or more to be generated.

The dresser, of which essential working parts are protected by accordion-type rubber sleeves, is not attached to the machine and may be moved from machine to machine, thus serving several grinders and dressing different forms on each by merely changing the templates. **T-4-26**

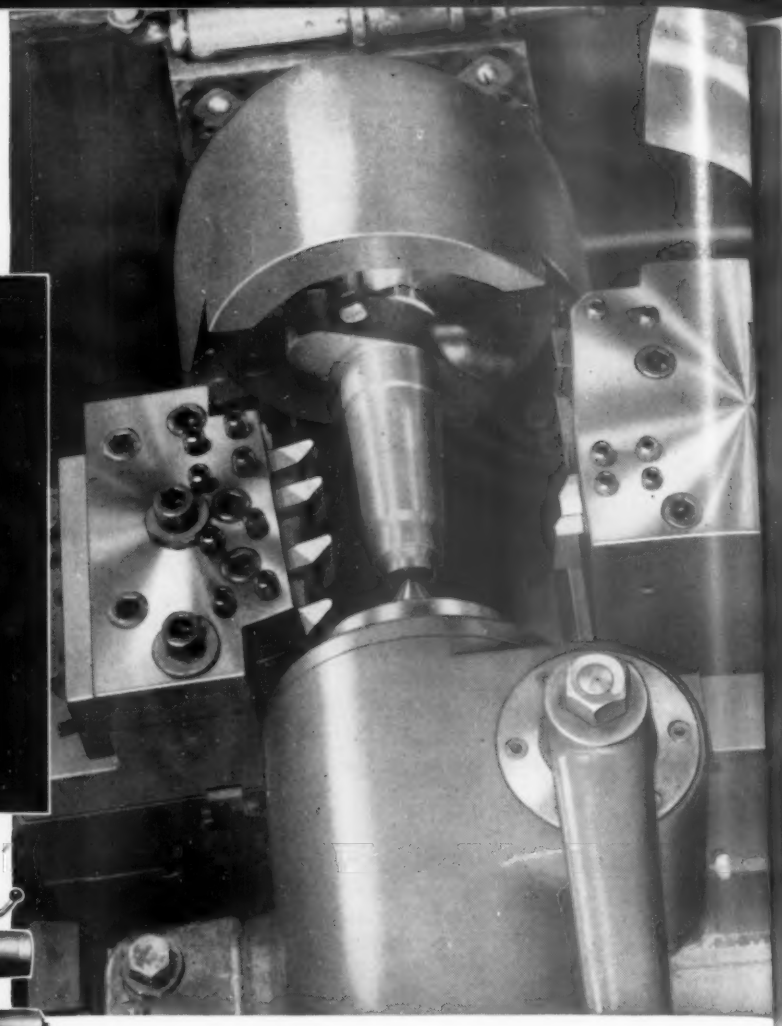
Independent Spindle Buffer

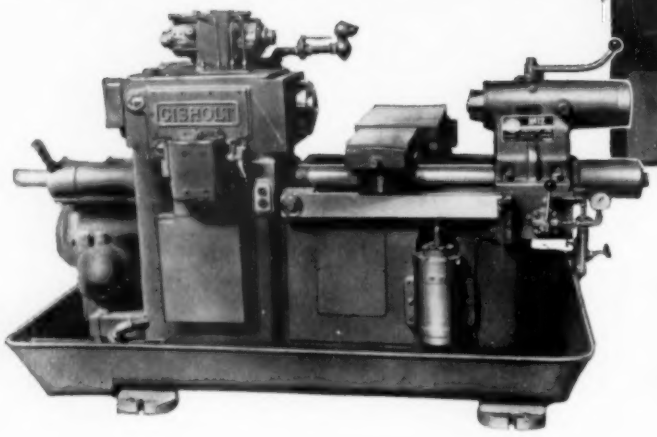
A new series of Buffing and Polishing Machines, by the Standard Electric Tool Company, is designed so that each spindle is individually operated; thus, two operators may work, each independent of the other. Design is compact and convenient, with the spindles overhanging the base to provide ample toe room.

Equipment on each side consists of a ball bearing motor, magnetic starter, push button station, hand brake with coincidental switch for simultaneously stopping the spindle and shutting off the current. Turning the "Speedial" controls, shown at front of machine, instantly changes the spindle speed which is then automatically recorded on the dial. Speed range is from 1500 to 3000 RPM. T-4-27



take a *Short Cut* on all cuts





with the GISHOLT *Hydraulic Automatic Lathe*

HERE'S a typical example of the ability of the Gisholt No. 12 Hydraulic Lathe to profitably combine a number of cuts in one operation.

In the machining of a type of Diesel Engine Injector Body (material—SAE 4150 steel forging, in lots of about 1000), *one* No. 12 operation is accomplishing the same work that formerly required two operations, one on each of two less versatile automatic lathes. And this work, which used to take about 5 minutes per piece to perform, is now completed in *1.5 minutes on the No. 12.*

Comparable savings are being realized on two other similar types of injector bodies, with rapid changeover, through the machining advantages of the Gisholt Hydraulic Lathe.

One reason so many jobs are done faster on the Gisholt No. 12 lies in the wide latitude of tooling arrangements it makes possible. Operations such as taper turning, forming, angular facing, constant speed radius cutting and intermittent facing can be efficiently combined with orthodox turning, facing, boring, and grooving.

Investigate the characteristics of this advanced automatic lathe that give it such remarkable earning power.

GISHOLT MACHINE COMPANY

Madison 3, Wisconsin

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface finishing and balancing of round and semi-round parts. Your problems are welcome here.*

TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES

Why "M-11" produces

MORE TAPPED HOLES PER TAP

M-11 is a chrome-cobalt high speed steel used exclusively by Detroit Tap and Tool Company for taps, thread gages and thread milling cutters. Some of the reasons for its use are:

COBALT . . . Takes the human element out of hardening. THIS MEANS THAT UNIFORM HEAT-TREAT CAN BE OBTAINED AUTOMATICALLY!

Increases the red hardness over ordinary HSS. THIS MEANS M-11 TAPS ARE HARDER, TOUGHER AT OPERATING TEMPERATURES.

CHROMIUM . Increases toughness and strength of steel after heat treatment. THIS MEANS LESS BREAKAGE.

Causes hardness to penetrate deeper and more uniformly. THIS MEANS SAME QUALITY AFTER AS BEFORE SHARPENING.

Resists corrosion. PROTECTS TOOLS IN TOOL ROOM. ALLOWS GREATER LATITUDE IN COOLANTS.

Provides greater resistance to abrasion. THIS MEANS MORE PIECES PER SHARPENING, MORE THREADS PER TAP.

This combination of chromium and cobalt in Detroit Tap's M-11 high-speed steel is available to you at no increase in cost over quality taps made of ordinary high-speed steels. And back of every M-11 tap, thread gage and thread milling cutter is Detroit's SERVICE — a service which can make the proud claim:

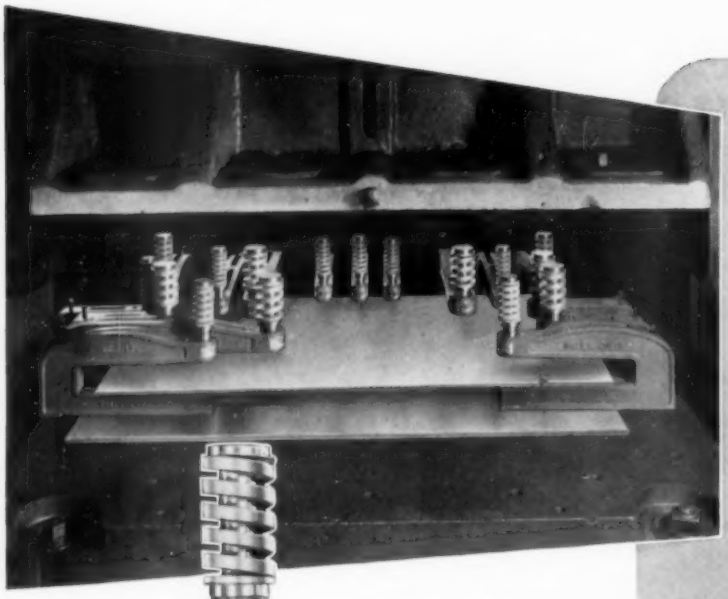
WE'VE NEVER "SHUT DOWN" A LINE YET!!

DETROIT

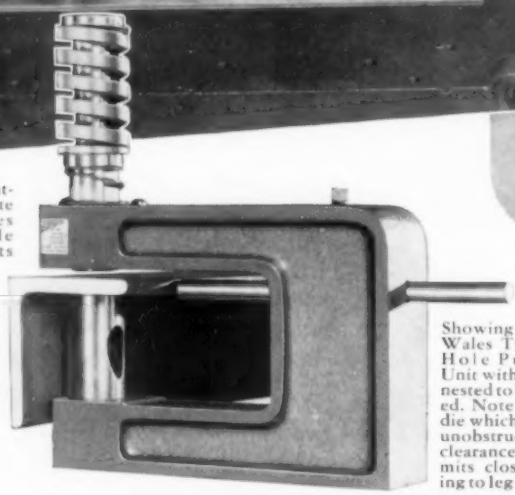
TAP & TOOL CO.

8432 BUTLER STREET • DETROIT 11, U. S. A.

The Home of
"M-11"
CHROME-COBALT HSS TAPS, THREAD MILLING CUTTERS & THREAD GAGES



Above—Illustrating mounting plate setup of Wales Type "CJ" Hole Punching Units ready to punch the ¼" thick work in position.



Showing a typical Wales Type "CJ" Hole Punching Unit with ¼" angle nested to be punched. Note the high die which provides unobstructed slug clearance and permits close punching to leg of angles.

NOTHING CAN BE

~~WHAT COULD BE~~ SIMPLER

FOR HOLE PUNCHING THAN

THE

WALES

PATENTED AND EXCLUSIVE TEMPLATE MOUNTING METHOD*

...one important application is in combination with

WALES Type "CJ" UNITS

for punching mild steel up to

1/4" THICK

● Wales Patented Mounting Method requires only ***one template*** and only Wales Units have this simple setup method. The template serves a dual purpose by combining the mounting plate and the hole punching pattern.

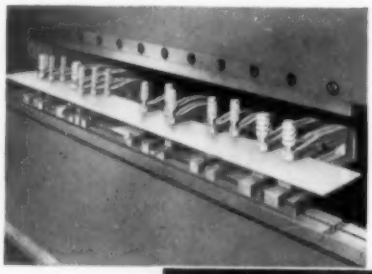
Faster setups, almost complete elimination of press "down time", and easier storing of combined templates and mounting plates without Wales Units are NEW money-saving and time-saving advantages that cannot be overlooked in today's high cost of production.

Tooling is reduced to a simple, quick assembly operation by Wales Units. This self-contained and versatile equipment may be used and reused in an unlimited number of setups keeping the die investment in continuous productive operation.

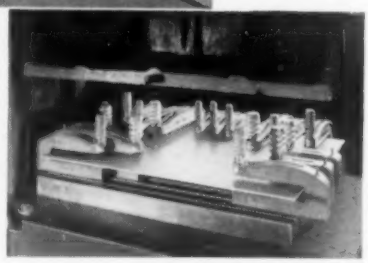
Write for complete information, catalogs and bulletins.

* *Note: Wales-Strippit Corporation has not granted permission to anyone to use this patented mounting method except with Wales Hole Punching and Notching Equipment.*

WALES TYPE "CJ" HOLE PUNCHING UNITS USED ON T-SLOTTED PLATES IN STAMPING PRESSES AND ON BED RAILS IN PRESS BRAKES



Showing a setup Wales Type "CJ" Units in press brake for punching staggered holes. Note the ¼" thick work in position in the Units.



Showing Wales Type "CJ" Hole Punching Units mounted on a T slotted plate in a stamping press with work read to be punched.

WALES-STRIPPIT CORPORATION

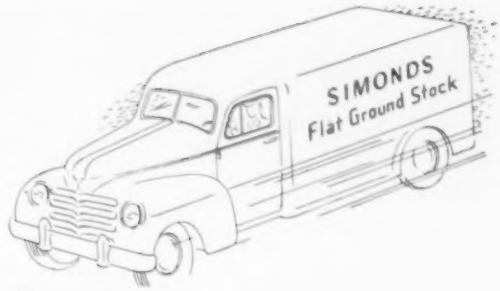
GEORGE F. WALES, President

393 PAYNE AVENUE, NORTH TONAWANDA, N. Y.

WALES-STRIPPIT OF CANADA LTD., HAMILTON, ONTARIO

Specialists in Punching and Notching Equipment

Get Delivery Today...



Save Time and Money...

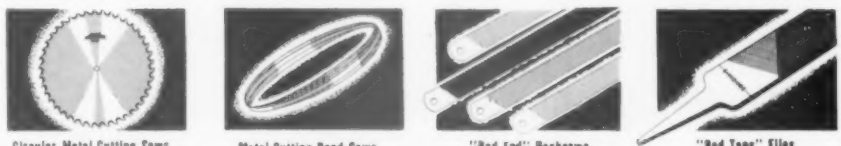
Make your own Dies, Jigs and Parts

HERE'S A COST-CUTTING *NATURAL* that you can cash in on *without any delay.* Get Simonds "Red Streak" Oil Hardening Flat Ground Stock from your Industrial Supply Distributor. He has it in all standard sizes . . . uniformly annealed for easy machining and proper hardening (with directions on the individual envelope) . . . cut to 18" length . . . accurately ground to standard thicknesses and widths . . . with square edges . . . and with smooth surfaces for accurate layout work.

No grinding to size. Just cut it . . . with Simonds Metal-Cutting Band Saws . . . to your own designs of punches, dies, gages, jigs, fixtures, templates, stamps, shims, small machine parts, and other items which you now have to order and wait for. Call your Distributor *today.*

BRANCH OFFICES: 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 416 West Eighth St., Los Angeles 14, Calif.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Ave., Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Washington. *Canadian Factory:* 595 St. Remi St., Montreal 30, Que.

SIMONDS ALSO MAKES



Circular Metal-Cutting Saws (Solid-Tooth, Inserted Tooth, Segmental) | Metal-Cutting Band Saws | "Red End" Hacksaws | "Red Tang" Files

PLUS A WIDE LINE OF TOOLS FOR CUTTING WOOD, PAPER, PLASTICS

SIMONDS "RED STREAK" Oil Hardening FLAT GROUND STOCK

"When you use Simonds you stay in the Highlands . . . of *consistent* cutting efficiency"

on 2 SUNNEN PRECISION HONING MACHINES ... At Sangamo Electric Company, Springfield, Ill.

"Precision In Miniature" at Sangamo is demonstrated by this ingenious application of Sunnen Honing.

The tiny ball race rings are too small to be held — even in the nimble fingers of the girls who operate these honing machines. The solution was found — and production was increased — by using small fixtures such as the one shown above.

Eight parts are loaded into each fixture — and all are honed at one time. Sunnen Honing at Sangamo has increased production and reduced rejects — in addition to solving a very difficult production problem.

Here are a few reasons why you may profit by using Sunnen Honing Machines in your plant:

- ACCURACY GUARANTEED TO .0001" — Corrects out-of-roundness and distortion. Produces straight round holes.
- HANDLES WIDE RANGE — Hones any hole from .120" to 2.625" in diameter — either blind or open holes — also parts with keyways.
- HONES MOST MATERIALS — Steel, cast iron, bronze, brass, aluminum, copper, plastics, ceramics, glass.
- PRODUCES SMOOTH FINISH — Hones to any micro-inch finish required — no high spots, chatter marks or other surface imperfections.

Write for details — or, on request, a Sunnen engineer will call at your plant.

SUNNEN

SUNNEN PRODUCTS COMPANY • 7956 Manchester Ave., St. Louis 17, Missouri

Canadian Factory: Chatham, Ontario

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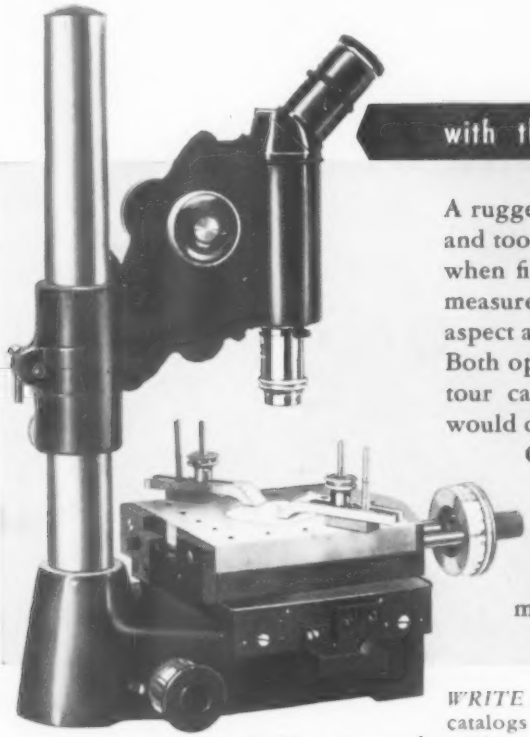
Save Man-Hours . . . *Save* Money . . .

In Producing and Inspecting Tools and Finished Parts

with the Bausch & Lomb CONTOUR MEASURING PROJECTOR

No other projector gives you this accuracy. With the protractor screen, all angular measurements can be read to ± 1 minute of arc (1′). Direct linear measurements, reading to ± .0001″, can be made by means of the cross slide stage. The projected, magnified image of the object on the ground glass screen is sharp, and well defined.

Dimensions, angles, and profiles of production-run parts can be compared directly with a traced outline of the projected image of the master part, or with a large scale drawing superimposed on the screen. Inaccuracies are located quickly and simply. Catalog D-27.



with the Bausch & Lomb TOOLMAKERS' MICROSCOPE

A rugged shop instrument especially designed for the machinist and toolmaker. It is used for precision linear measurements and, when fitted with the protractor eyepiece, for precision angular measurements. Objects and movements are seen in their natural aspect and direction . . . not reversed as in ordinary microscopes. Both opaque and transparent objects of regular or irregular contour can be measured. It is ideal for measuring parts which would distort under pressure of the most delicate instruments.

Operation is exceptionally simple and fast. Linear measurements to ± .0001″ can be made by means of the cross slide stage, controlled by two micrometer screws, and angular measurements to ± 1 minute of arc (1′). Various other attachments are available to meet special measurement problems. Catalog D-22.

WRITE FOR COMPLETE INFORMATION . . . The above listed catalogs illustrate and describe these and other Bausch & Lomb optical instruments for saving man-hours, and maintaining accuracy standards in metal working industries. Bausch & Lomb Optical Co., 763-Q St. Paul St., Rochester 2, N. Y.

BAUSCH & LOMB

OPTICAL COMPANY ROCHESTER 2, N.Y.

For complete descriptions of "Tools of Today" items keyed on the postage prepaid reply card of the TOOL ENGINEER'S Service Bureau page, turn to pages 65 through 73.

THE TOOL ENGINEER'S *Service Bureau*

FREE BOOKLETS AND CATALOGS CURRENTLY OFFERED BY MANUFACTURERS

10. Die Engineering Manual

The application of Carboloy Cemented Carbide to dies and punches for the efficient, economical drawing, forming, piercing, and blanking of sheet metal is thoroughly covered in this valuable engineering manual of 36 pages. *Carboloy Co., Inc.*

11. Drilling Machine

Model 325 single unit, sliding head, drilling machine, built by Cleereman Machine Tool Co., combines extreme sensitivity with rugged construction, as thoroughly described in 4-page bulletin. *Bryant Machinery & Eng'g Co., national distributors.*

12. Duplicating, Die-Less

New 40-page catalog illustrates the many rod parters, benders, shears, notchers, brakes, and forming machines which make up this Di-Arco line of bench tools for the economic precision duplicating of parts or pieces without delay or expense of complicated dies. *O'Neil-Irwin Mfg. Co.*

13. Furnaces, Surface

Bulletin shows recommended methods of heating and annealing copper, brass, and other non-ferrous alloys in slabs, sheets, strip billets and coils, using direct and radiant tube fired furnaces. *Surface Combustion Corp'n.*

14. Gages-in-stock Reports

Semi-monthly stock record bulletins indicate sizes and types of M-11 cobalt-chrome HSS thread, plug and ring gages that are currently available and where. *Detroit Tap & Tool Co.*

15. Hydraulic Equipment

Eight-page brochure presents the Adel precision-built products for exact hydraulic control. Included are gear-type power pumps, P.T.O. and magneto mounting pumps, 4-way selector valves, multi-bank stacking valves, cylinders, and power packs. *Adel Precision Products Corp.*

16. Lathe Tracer Control

Bulletin describes the Contourmatic—all hydraulic tracer control—for use with standard Cincinnati engine lathe in turning stepped shafts, facing of sharp shoulders, grinding necks, tapers and radii. *Cincinnati Lathe & Tool Co.*

17. Lifts, Levelator

Sixteen-page bulletin shows typical installations of these oil-hydraulic platform lifts which save plant space and manpower, among other benefits. Tailor-made, the many versions of this lift, plus many accessories, offer unlimited range of applications. *Rotary Lift Co.*

18. Material-Handling Handbook

Fifty-six page guide for the analysis of material-handling operations as related to the application of power industrial trucks. *The Electric Industrial Truck Ass'n.*

19. Metal Working Tools and Machines

An extensive line of punches, shears, foot presses, bending brakes, power presses and shears, die, small tools and other equipment is the subject of the new Whitney-Jensen 48-page catalog. *Whitney Metal Tool Co.*

20. Micrometer, Controlled Pressure

Bulletin covers the improved Supermicrometer, a precision instrument with controlled measuring pressure, which measures directly to one ten-thousands of an inch. Bridges the gap between hand micrometer and the P & W standard Measuring Machine which measures directly to .00001". *Pratt & Whitney Div'n, Niles-Bement-Pond Co.*

21. Molded Bases, Standard

Completely new, comprehensive, 152-page catalog of DME standard mold bases, parts and products, designed for the plastics and die casting industries, is a real money-saving source of engineering and buying information. *Detroit Mold Engineering Co.*

22. Nuts, Self-Locking

Fourteen-page catalog of descriptive information and technical data on Flex-Loc self-locking nuts, made in one solid piece, being both lock and stud nut, offering excellent carrying capacity and uniform torque. *Standard Pressed Steel Co.*

23. Press Selection

An unusually practical bulletin offers a comprehensive and functional analysis of "How to Select a Press" for blanking, drawing, ironing, and squeezing. It was prepared to help press users determine what type of press is most suitable for specific job requirements and what methods of power application are most efficient. *Verson All-steel Press Co.*

24. Presses, Air-Hydraulic

Simply constructed air-hydraulic presses perform kick and arbor press operations, such as forming, flanging, marking, assembly, riveting, broaching, crimping, staking, and press fitting. 12-page catalog. *Air-Hydraulics, Inc.*

25. Pulleys, Variable Speed

The Roto-Cone line of variable pitch pulleys for accurate speed control is fully described in 16-page catalog. These motor pulleys are designed for maximum output with positive control, employing V-V drive. *Gerbing Mfg. Corp'n.*

26. Punch Press Feeder

Bulletin gives detailed information on the many production and safety features of the Feed-O-Matic, which is in effect a mechanical hand. Eliminates operator hasard while speeding output on secondary punch press work. *Covert Mfg. Co.*

27. Saw, Band

Bulletin outlines the many economic and safety features of this steel-clad 14" band saw, including fully-enclosed motor and mechanisms, Textolite disc wheels, improved blade guides, generous-size work table, greater speed and longer life. *Boice-Crane Co.*

28. Steel, Low Carbon Nickel

Engineering report on the newly developed low carbon 8½% nickel steel, which is finding a wide range of applications where sub-zero temperatures are encountered or used, and in other fields where its corrosion resistance and other properties are of value. *The International Nickel Co., Inc.*

29. Taps, Dies & Reamers

1948, 224-page edition of the Butterfield catalog provides a very complete listing of the extensive line of taps, dies and reamers available. Specification and price sections are supplemented with a series of useful tables and general shop information. *Union Twist Drill Co., Butterfield Div'n.*

30. Torque Control System

Remote torque control system, proven in aircraft, is adaptable to many industrial applications. Provides electrical means for manually or automatically transforming a weak motivating force into control of a predetermined operation at a remote location with great accuracy. *Eclipse-Pioneer Div'n, Bendix Aviation Corp'n.*

31. Welding Rods Directory

This 8-page bulletin is packed wtih vital reference data in handy chart form for the selection of rod needed for practically any repair or production weld job, arc or torch, heavy or thin base metal, with all major groupings of metals and alloys. *Eutectic Welding Alloys Corp'n.*

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Detroit 26, Michigan

Circle items desired and mail this card (Students are requested to write direct to manufacturers)

THE TOOL ENGINEER'S *Service Bureau*

FREE BOOKLETS AND CATALOGS CURRENTLY OFFERED BY MANUFACTURERS

1. Adhesives, Industrial

Adhesives, sealers and coatings tailored to the job result from the research help available to industrial customers, as offered in new 28-page brochure. Included are 18 typical case histories and data on 26 of the more than 1,000 formulae offered by Detroit Adhesives and Coatings Division. *Minnesota Mining and Mfg. Co.*

2. Aluminum Sheet and Plate

A 48-page booklet of technical information on various sheet and plate alloys, gauges and sizes. Subjects discussed include cost factors, formability, weldability, heat treating, finishes, characteristics of aluminum, and many others. *Reynolds Metals Co., Aluminum Div'n.*

3. Bearing Alloys

This is the first in a series of technical papers presenting information of physical and metallurgical properties in relation to operating conditions, information essential to selection of a suitable cast-bronze bearing alloy. *The Bunting Brass & Bronze Co.*

4. Boron Master Alloy

Bulletin presents the essential facts about Boron Master Alloy, a chemically balanced alloy of boron and iron for adding boron to steel and cast iron, which increases the depth of hardenability, improves cutting qualities of high speed tool steels, and provides other benefits. *Norton Company.*

5. Broach, External

Bulletin presents typical case history of how Apex-engineered broaching set-ups enabled the gear manufacturer to achieve an economical production of a 3-splined alloy steel cylinder, accurately and with excellent finish. *Apex Broach Co., Inc.*

6. Broaching Machine, Vertical

Twelve-page bulletin covers the new vertical Cyclomatic broaching machine. Ten close-up views of tools, fixtures, and machines illustrate the method of automatic tool handling, work centralizing, and work ejection, plus other features. *The Oilgear Co.*

7. Casting Salvage

Bulletin offers practical procedures for salvaging cast iron, bronze, aluminum, and malleable iron casting by welding. *Eutectic Welding Alloys Corp'n.*

8. Control Systems, Production

Synchronized materials and production control, tailored to fit the job, prevents production bottlenecks, speeds and simplifies writing of purchase and production orders, and assures customer satisfaction. *Remington Rand, Systems Division.*

9. Coolant Separators

Twelve-page bulletin illustrates the magnetic-automatic coolant separators for honing and grinding machines. These self-contained motor driven units attracted considerable attention at the ASTE Show. *Barnes Drill Co.*

(Continued on next page)

Circle *items desired* and mail this card (Students are requested to write direct to manufacturers)

LITERATURE FEATURED IN ADVERTISEMENTS THIS MONTH

A1. A. K. Allen Co. Illustrated booklet Allen Dial Feed Tables.

A2. Aber Engineering Works. New catalogue and guide to buying milling cutters.

A3. Acme Industrial Co. Catalog of drill jig bushings.

A4. Bausch & Lomb. Catalogs, D-27 and D-22 covering Contour Measuring Projector and Toolmakers' Microscope.

A5. Chas. H. Besly and Co. Booklet of helpful facts on Abrasive Wheels.

A6. Brown & Sharpe. Specifications and details new No. 5 Cutter and Tool Grinding Machine.

A7. Carboloy Co. Brochure: "The more profitable use of diamonds for dressing grinding wheels."

A8. Commander Mfg. Co. Descriptions and details, adjustible "Multi-Drills."

A9. Detroit Reamer & Tool Co. Illustrated bulletin of Circularity-Grinding Attachment.

A10. A. B. Farquhar Co. Catalog showing wide range in sizes and capacities of hydraulic presses.

A-11. Giern & Anholtt Tool Co. Complete information of Rotary Bushings.

A12. Heald Machine Co. Bulletin describing Heald Multi-Way Bore-Matics.

A13. Kempsmith Machine Co. Bulletin No. 134 describing index centers.

A14. Kennametal, Inc. "Performance Reports" of Kennametal tools on interrupted cutting.

A15. Latrobe Electric Steel Co. Handy reference tables of useful information cover Latrobe high-speed steels, tool, and die steels.

A16. R. K. LeBlond Machine Tool Co. Bulletin No. 5 describing Dual-Drive Lathes.

A17. Logansport Machine Co., Inc. Literature on Logan air valves, cylinders and accessories.

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A25. Ohio Knife Co. Current catalog.

A26. Pope Machinery Corp. Data sheets 16, 17, 18, 19 on motorized grinder spindle.

A27. Pratt & Whitney. Illustrated bulletin on Plain and Universal Die Sinkers.

A28. Reed Rolled Thread Die Co. General bulletin 5-1 covering thread and form rolling tools and machines.

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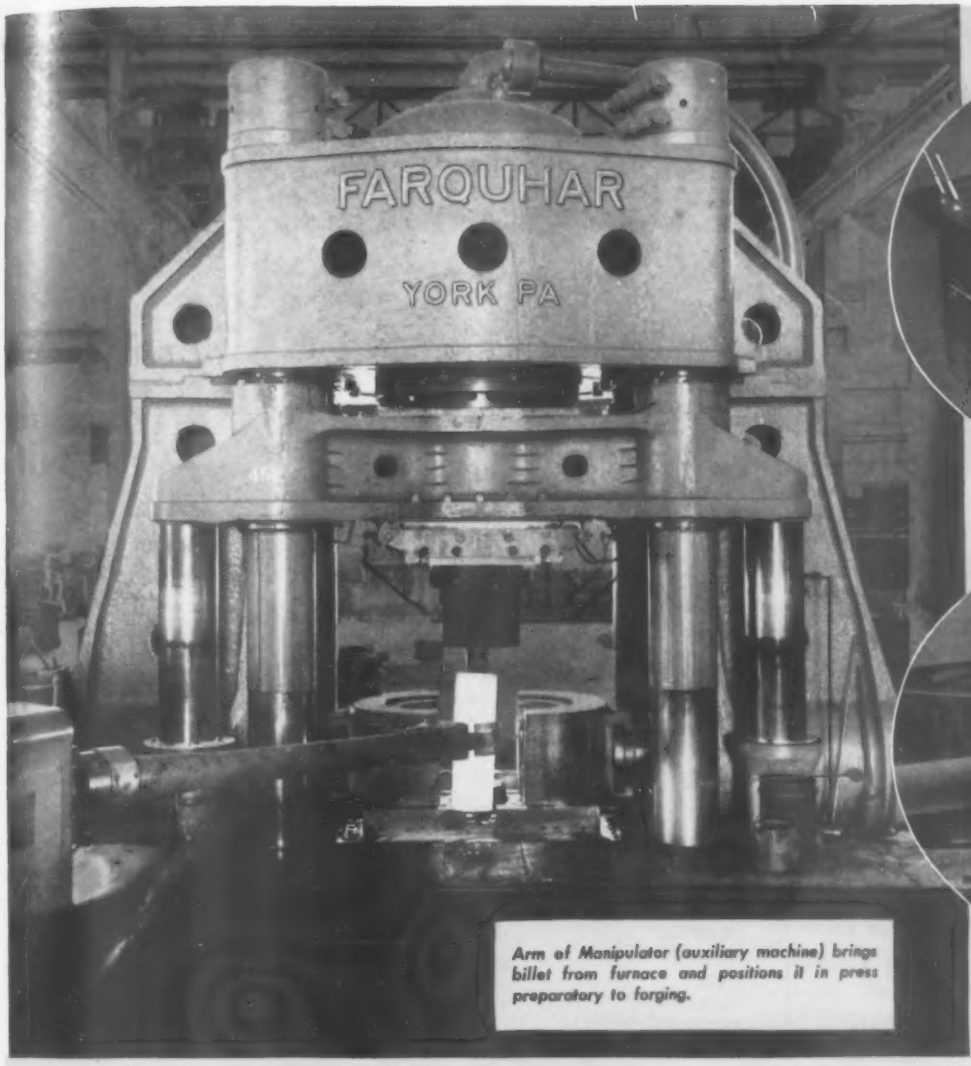
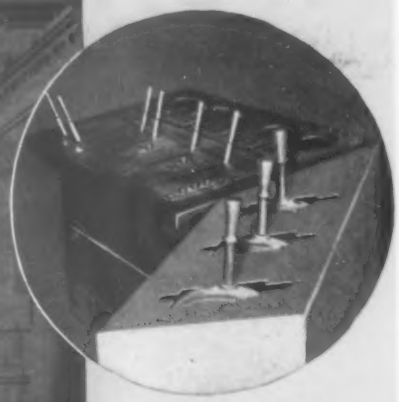
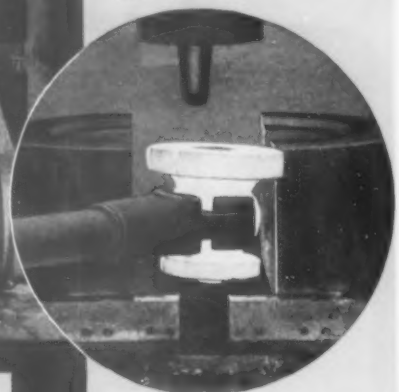


Arm of Manipulator (auxiliary machine) brings billet from furnace and positions it in press preparatory to forging.



Above: Remote Farquhar control panel which is handled by one operator for controlling all press operations.



Above: Manipulator arm removing finished forging from press. One operator handles manipulator, another helps guide the positioning of billet.

FARQUHAR HYDRAULIC PRESS

turns out better forgings *faster* for Cameron Iron Works

THIS GIANT 5000-ton Farquhar Hydraulic Press has a big job to do at the Cameron Iron Works, of Houston, Texas —*and it's doing it!*

Cameron needed faster and better production of tubing head spools which are used for well completions in the oil industry. These parts had formerly been produced from steel castings. By using the built-to-specification Farquhar Press to turn out 800-lb. forgings of the spools instead (see illustrations), Cameron speeded up production, saved time and labor.

Advantages of forgings by the Farquhar Press over the castings are: *Cheaper to produce . . . Forgings free from porosity . . . Uniform in physical properties . . . Controlled in grain structure.* And—the Farquhar Press operated at a minimum of maintenance cost. Cameron gets higher quality at lower costs for this operation—still can convert the Press for other production jobs in the future.

Farquhar Presses Cut Your Costs

Just one more example of cost-cutting Farquhar performance in heavy production. Farquhar Presses are built-for-the-job . . . Presses that assure *faster production* due to rapid advance and return of the ram . . . *greater accuracy* because of the extra guides on moving platen . . . *easy, smooth operation* with finger-tip controls . . . *longer die life* due to positive control of speed and pressure on the die.

Farquhar engineers are ready to help solve whatever production problem you may have. Give them a call.

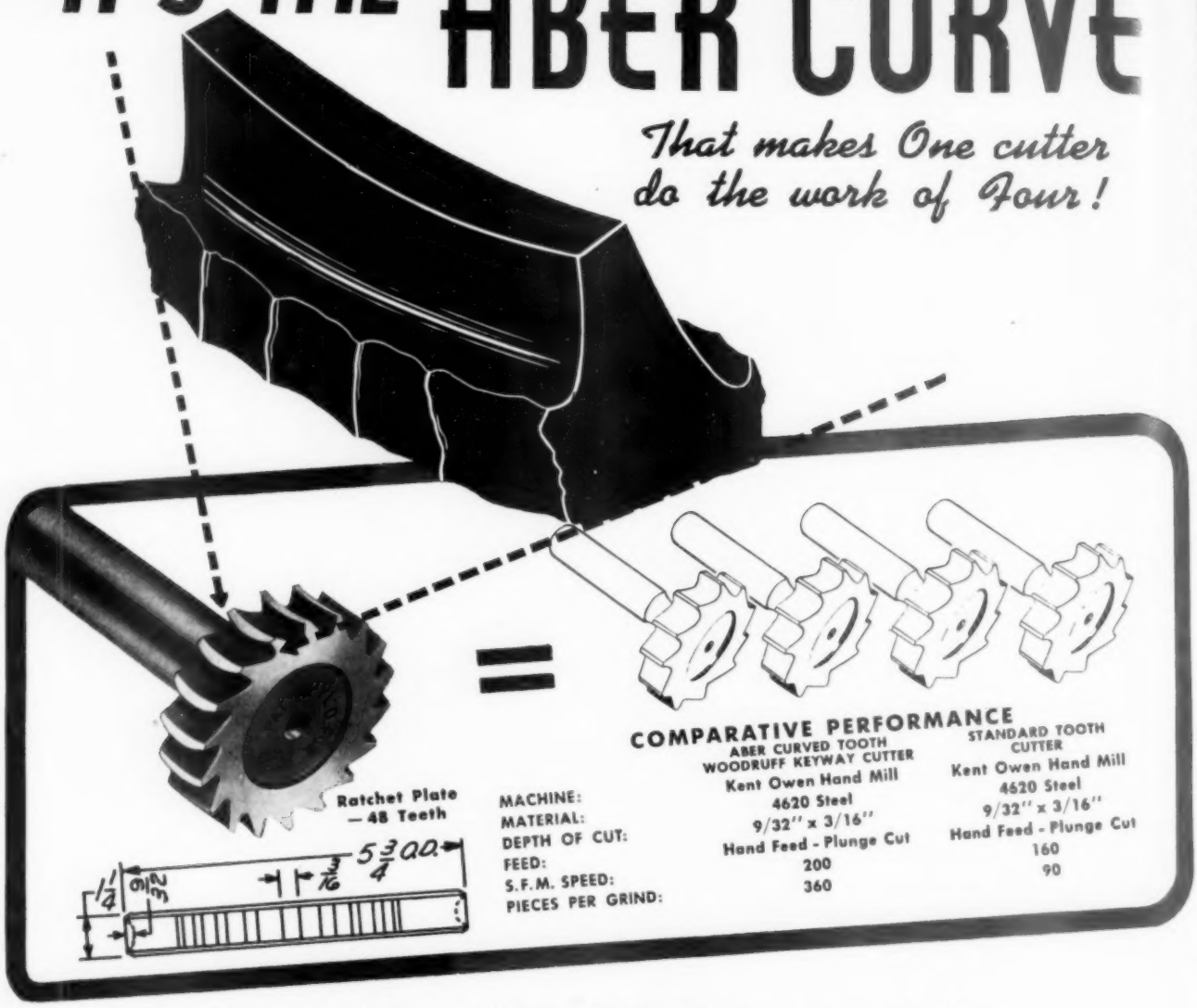
Send For Free Catalog showing the wide range of Hydraulic Presses Farquhar builds in all sizes and capacities for all types of industry. Your FREE copy is waiting. Write to: A. B. Farquhar Co., *Hydraulic Press Division,* 1519 Duke St., York, Pa.

Farquhar
HYDRAULIC PRESSES

for Bending • Forming • Forcing • Straightening • Assembling • Drawing
Extruding • Joggling • Forging • and other Metal-working Operations

IT'S THE ABER CURVE

That makes One cutter do the work of Four!



COMPARATIVE PERFORMANCE	ABER CURVED TOOTH WOODRUFF KEYWAY CUTTER	STANDARD TOOTH CUTTER
MACHINE:	Kent Owen Hand Mill	Kent Owen Hand Mill
MATERIAL:	4620 Steel	4620 Steel
DEPTH OF CUT:	9/32" x 3/16"	9/32" x 3/16"
FEED:	Hand Feed - Plunge Cut	Hand Feed - Plunge Cut
S.F.M. SPEED:	200	160
PIECES PER GRIND:	360	90

Yes, in an actual test in a large pipe threading company's shop, ONE Aber Curved Tooth Woodruff Keyway cutter performed the work ordinarily requiring FOUR cutters of standard tooth design. This 400% increase in cutter performance is by no means unusual, for Aber's exclusive curved tooth design permits a smoother finish, absence of chatter, greatly increased cutter life, and cuts more freely with far less hand pressure from the operator. In addition, it proved to be a tremendous saver of "down" time, and reduced costs in the cutter grind room.

Write today for your free copy of the new Aber Catalog, containing a wealth of information on the latest developments in the milling cutter field. A sound, practical guide to cutter buying.

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ENGINEERING WORKS INC.
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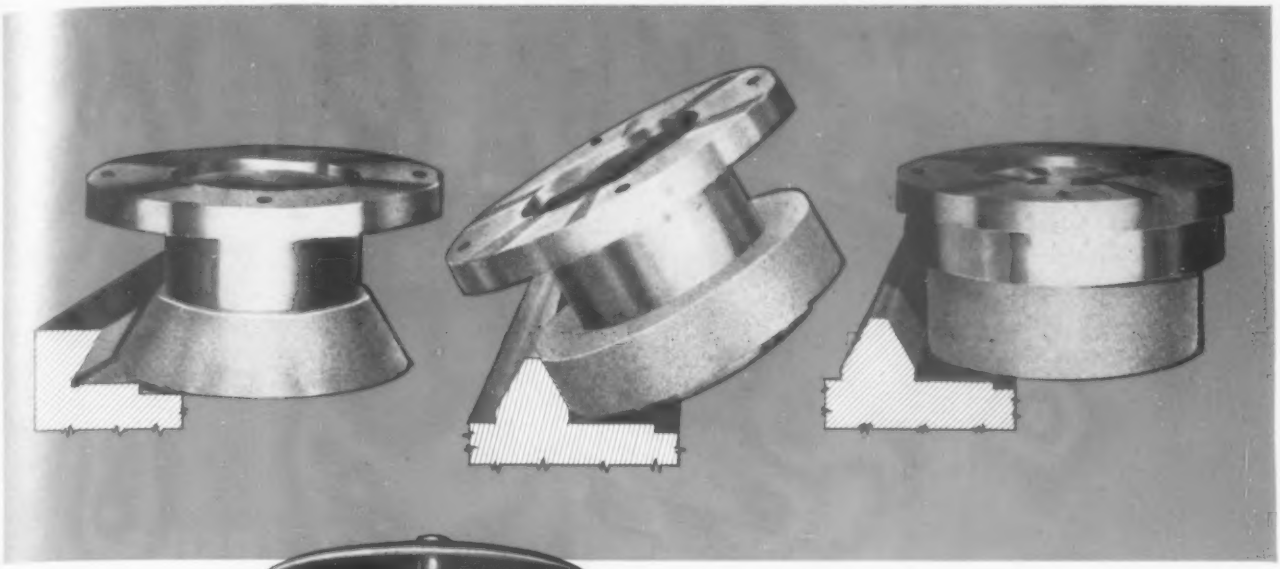

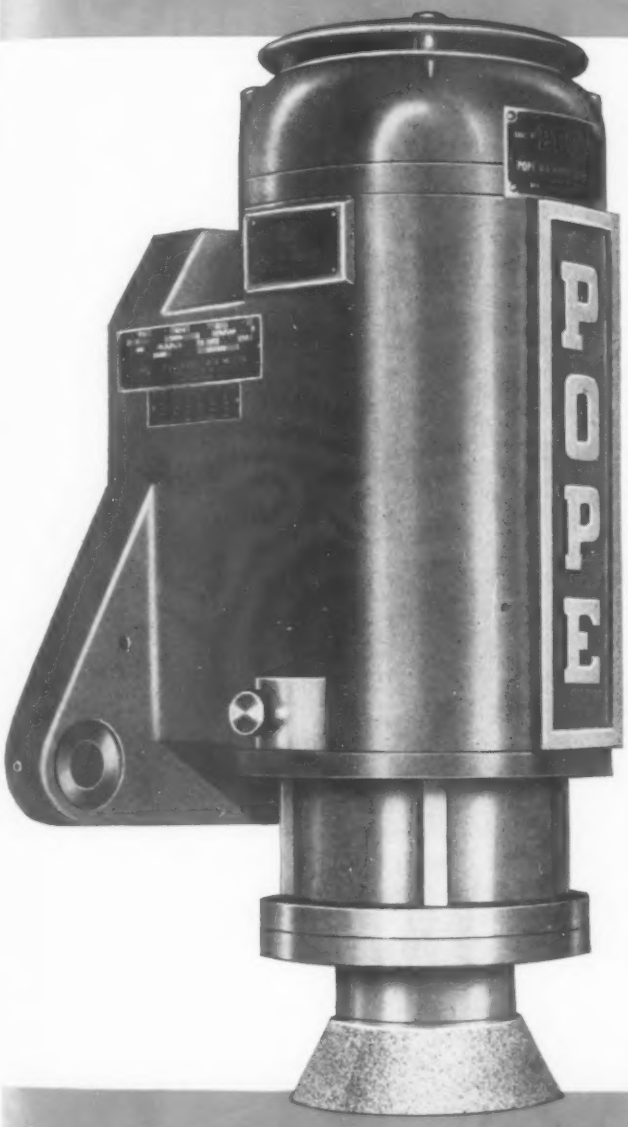

Versatile IS THE WORD FOR THIS POPE MOTORIZED GRINDER SPINDLE . . .

Every user is enthusiastic about the performance of this powerful Spindle with *sealed-in* lubrication and totally enclosed, fan cooled motor. It has the bearing capacity and the rigidity to *rough off surplus metal fast* and produce superior final finishes as well.

As you see, it may be equipped with a wide flange spindle nose for *quick mounting* of various types of grinding wheels or other tools which are readily attached by easy-to-get-at screws. No fumbling around for blind holes.

This useful and popular Spindle comes in 3, 5 and 10 HP, 1200, 1800 and 3600 RPM. Other HP's and speeds are available on special order. Write for Data Sheets 16, 17, 18 and 19.

No. 42

POPE
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POPE MACHINERY CORPORATION
ESTABLISHED 1920
261 RIVER STREET • HAVERHILL, MASSACHUSETTS
BUILDERS OF PRECISION SPINDLES

This Little Tap Lived 7 Times Longer

● Small-sized tools no longer need be short-lived. Take this No. 2, 64-thread high-speed tap, for example. It was bought by the Webster Electric Co., of Racine, Wisconsin, to tap Dow Metal. The normal life of similar taps had been 500 to 2,000 pieces. Before putting this tap into service, it was flash-chrome plated by Racine's Lundbye Process. Then, as wear began to show up after 2,500 pieces, a second plating was applied. Later, a third was added with the result that the delicate little tool tapped *over 7,000 pieces* in all. This is just one example of hundreds of tool and money-saving jobs accomplished by Racine Lundbye Process . . . the flash-chrome finish that produces greater wear-resistant surfaces due to the extreme hardness obtained in coatings measured in millionths. Similar savings can be made in your plant.

RACINE *Lundbye Process Chrome* GIVES TOOLS 300% LONGER LIFE

RACINE *Tri-Chrome* RECLAIMS VITAL PARTS AND TOOLS

Racine Plating Company, Inc.

RACINE, WISCONSIN

Specialists in Chrome Plating

COPPER • NICKEL • CADMIUM • POLISHING • PICKLING

Now! A HEAVY DUTY BORING and THREADING **TOOL HOLDER** with vertical adjustment

Here's a new heavy duty boring tool holder designed to fit all sizes of Bokum Boring Tools up to No. 12. It brings you greater speed and accuracy in setting boring tools to correct height—a real convenience when setting up such critical jobs as taper boring or internal threading.

The holder and 6 split-sleeve adapters form a set in a special box. The holder is bored to take 1½" shanks directly and with sleeves the following shank sizes: ½", ⅝", ¾", ⅞", 1" and 1¼".

Send for catalog T-483

For complete catalog of Bokum Boring Tools ask for T-1139 for super high speed tools and for T-398 for carbide-tipped tools.

BOKUM TOOL CO.

14775 WILDEMERE AVE. • DETROIT 21, MICH.

SINGLE POINT BORING TOOLS—INTERNAL THREADING, BOTTOMING AND FACING TOOLS—CARBIDE TIPPED TOOLS

NEW Air-Hydraulic • Automatic *Drillhead*

SPEEDS PRODUCTION • CUTS COSTS

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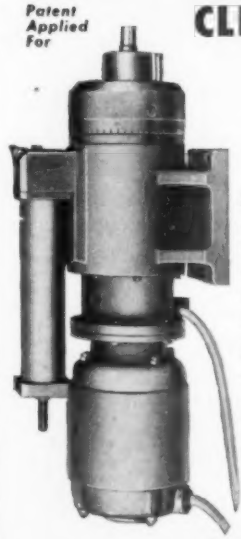


CLEVELAND REPUBLIC

MODEL 250 DRILLHEAD

Has rapid approach and return • Holds controlled-depth drilling and counter-boring to .001 tolerances • Variable positive feed • Micrometer depth adjustment.

● For low cost, precision drilling on production work, here's your answer—the new Cleveland Republic Drillhead. Has controlled, positive feed with ball bearings traveling forward with spindle to prevent "whipping" and distortion.

FEEDS from 0" to 75" per minute with variable adjustment. Depth drilling and counter-boring are controlled to .001 by micrometer adjustment and lock screw. Operates on 50 lb. air line pressure. Drills in any plane, any angle, any position. Weight: approx. 65 lbs.

Ask your distributor for information—or write the address below.

CLEVELAND REPUBLIC TOOL CORP.

Sales Office: 1265 UNION COMMERCE BLDG., CHerry 1937

Main Plant and Foundry Division: MEECH AVE.

CLEVELAND, OHIO

ANNOUNCING

AN ADDITIONAL LINE OF REAMERS

Carbide **REAM-RITE** *Tipped*

by SUPER

CHECK YOUR OPERATIONS TODAY. WRITE FOR BULLETIN ON THIS NEW TOOL!

NEW LOW PRICES

Almost Down to H.S.S.

Now you can get the better finish and longer wear of carbide on many jobs where carbide has been regarded as too costly!

All sizes in stock, ready for immediate shipment.

STRAIGHT SHANK — STRAIGHT FLUTE

STOCK NO.	SIZE IN.	NO. OF FLUTES	SHANK DIA.	LENGTH O. A.	STD. PKG. QUAN.	PRICE EACH
NRS-1	1/4	4	7/32"	6"	6	$3.75
NRS-2	9/32	4	1/4"	6"	6	4.00
NRS-3	5/16	4	9/32"	6"	6	4.00
NRS-4	11/32	4	9/32"	6"	6	4.25
NRS-5	3/8	4	11/32"	7"	6	4.25
NRS-6	13/32	4	11/32"	7"	6	4.75
NRS-7	7/16	4	3/8"	7"	6	4.75
NRS-8	15/32	4	13/32"	7"	6	5.00
NRS-9	1/2	6	7/16"	8"	6	5.50
NRS-10	17/32	6	7/16"	8"	6	5.75
NRS-11	9/16	6	7/16"	8"	3	5.75
NRS-12	19/32	6	7/16"	8"	3	6.25
NRS-13	5/8	6	1/2"	9"	3	6.25

Not supplied in Taper Shank (we suggest use of std. split sleeve reamer driver if T.S. is necessary.) Standard tolerance, plus .0005", minus .0000".

STANDARDIZE ON SUPER

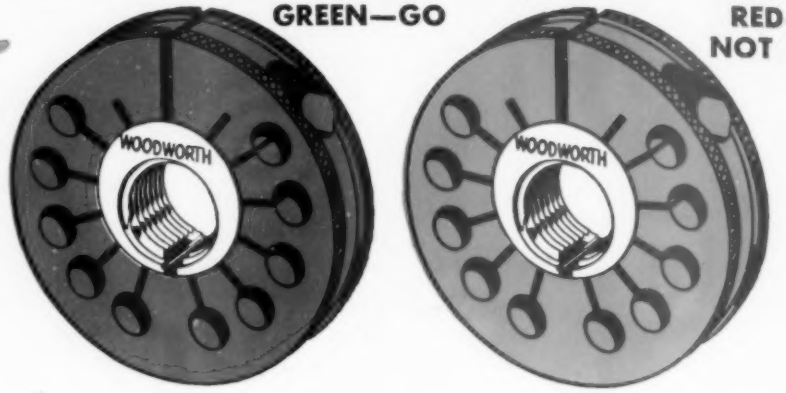
Super leads in carbide tool developments and carries large stocks of frequently used carbide tools for immediate shipment.

STANDARD AND SPECIAL **SUPER** *Carbide Tools*

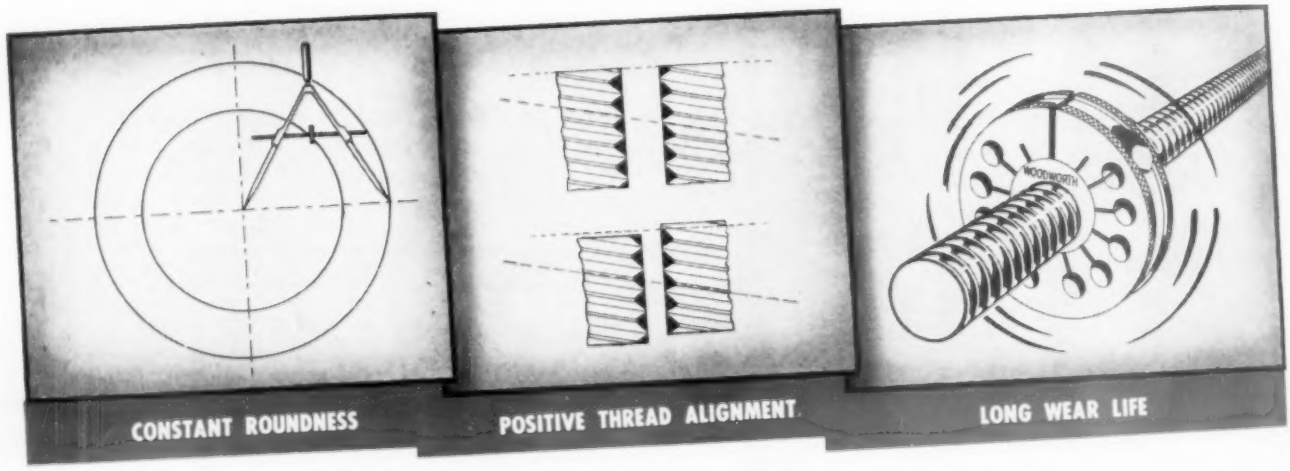
SUPER TOOL COMPANY

21650 Hoover Rd., Detroit 13, Michigan • 5210 San Fernando Rd., Glendale 3, California

Honestly now—



. . . DOES YOUR PRESENT RING GAGE GIVE YOU THESE BENEFITS?



IT *STARTS* ROUND AND *STAYS* ROUND WITH EVERY ADJUSTMENT

Constant roundness, positive thread alignment and long wear life—are you getting those benefits from your present thread ring gage? Today across the country, scores of industries are converting these Woodworth Gage features into dollar profits.

There's no intricate mechanism to adjust. It's mechanically simple. Once adjusted, the setting will not change with ordinary shop use.

In addition Woodworth gages are 50% less in weight and have positive identification with Green for Go Gages and Red for Not Go Gages. We'll be happy to answer any inquiries addressed to the Company.

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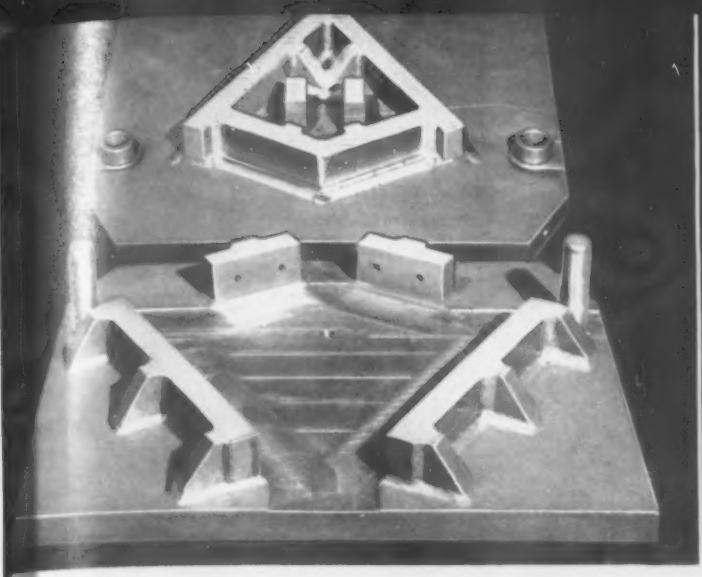
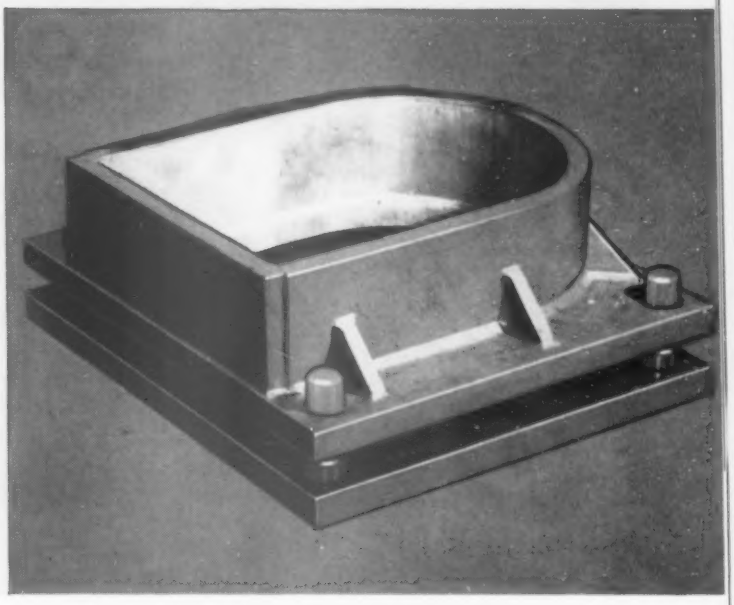
N. A. WOODWORTH CO. • 1300 EAST NINE MILE ROAD • DETROIT 20, MICHIGAN

PRECISION GAGES • DIAPHRAGM CHUCKS • CONE-LOK JIGS • PRECISION PARTS



DANLY SPECIAL-PURPOSE DIE SETS

DIFFERENT SIZES
DIFFERENT SHAPES
DIFFERENT PURPOSES



The same DANLY Precision

THE design, shape, size of a die set is determined by its purpose. Many tool designers and engineers have found that only *specially* designed and constructed die sets can do the job efficiently. Torch cut pockets, slots, bored die pockets, planed or milled keyways, drilled knockouts, slug or hold-down holes, welded steel mounting pads—all of these operations and more can be performed at Danly during production of the die set.

This service can be especially valuable to you in the production of large die sets. Additional cutting and welding operations, so easily handled at Danly, may cause difficulty in the die shop or your own tool room where equipment is not specifically suited to large work.

The die sets shown on this page are typical of the kind of work performed in Danly's well-equipped shops. These sets are widely different, but all have the same *Danly Precision*. Freely consult Danly's engineering department for quotations.

DANLY MACHINE SPECIALTIES, INC., 2100 So. 52nd Ave., Chicago 50, Illinois

DANLY *Special* DIE SETS

MACHINED TO YOUR SPECIFICATIONS

OIL-FILLED BENCH STONES...

...DELIVER *EXTRA SHARPENING SERVICE* at the PRICE OF DRY STONES

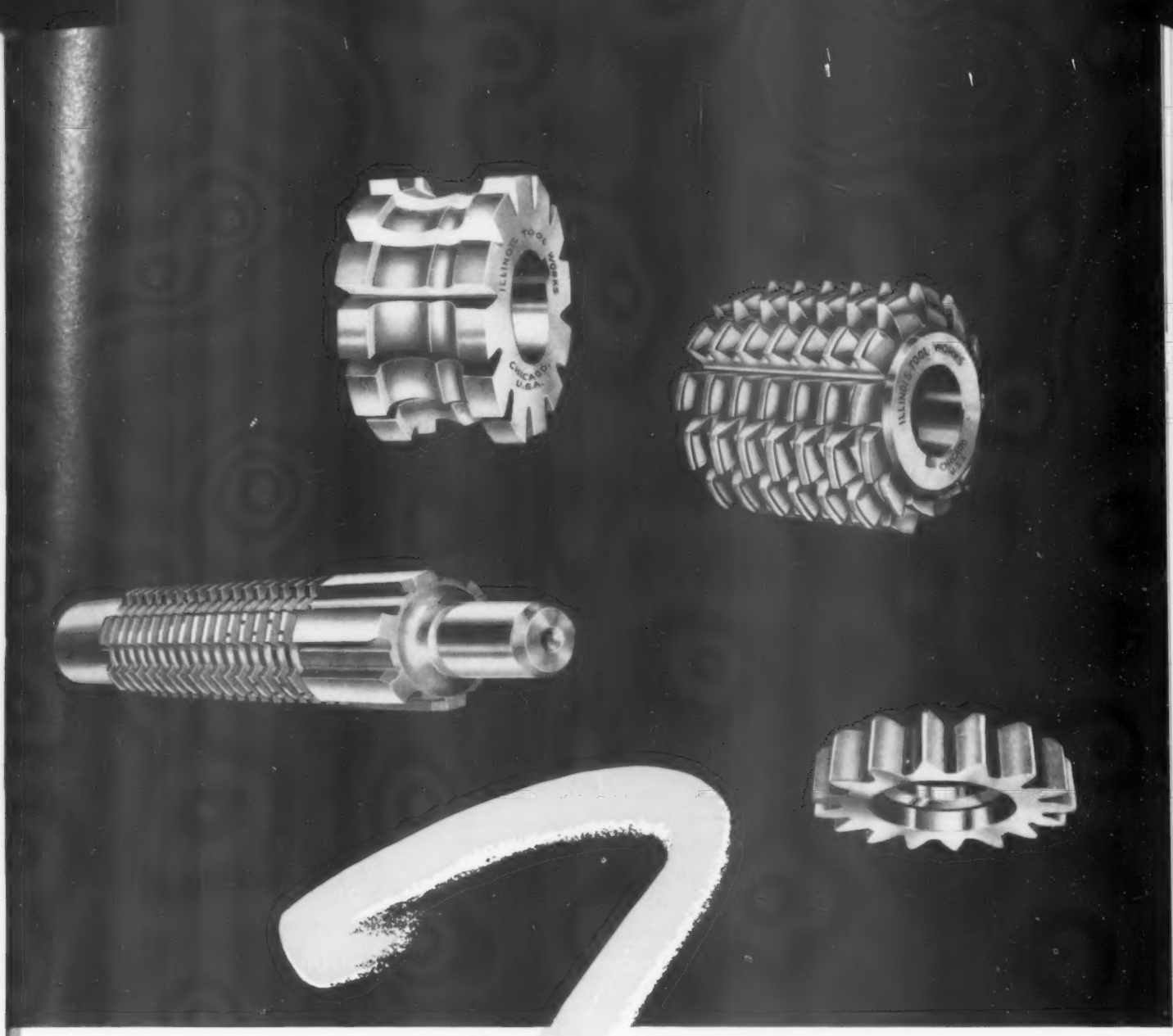
Oil filling is a built-in extra service feature of Crystolon Bench Stones—at the price of regular dry stones. And this is important, because bench stones are supposed to be used with oil. Oil makes them cut faster and cooler and produces a better cutting edge. Oil also helps them resist glazing or filling.

But oil filling is a messy job at best—and it has to be done right. The oil must penetrate the pores of the entire stone. And, unless the right kind of oil is used, the surface of the stone will gum.

Crystolon Bench Stones are made of genuine Norton silicon carbide abrasive, vitrified bonded and oil-filled at the factory for your convenience and for better sharpening. Ask your Distributor to furnish oil-filled Crystolon* Bench Stones for extra service at no extra cost.

** For oil-filled aluminum oxide bench stones, specify "India."*

BEHR-MANNING
(DIVISION OF NORTON COMPANY)
TROY, N. Y.



which do YOU need

...A HOB, SHAPER CUTTER, MILLING CUTTER OR BROACH FOR SPECIAL APPLICATIONS?

When they come from Illinois Tool Works they are engineered for *your* application . . . engineered for important "extra" production in *your* machines on *your* job. Over 35 years of toolmaking experience assure you that tools marked "Illinois" always mean greater tool life and lower production costs. So, when you need hobs, broaches, shaper cutters or milling cutters . . . call "Illinois Tool"!

headquarters for engineered cutting tools

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2501 North Keeler Avenue • Chicago 39, Illinois

Again, Again and Again...

Besly Grinders Make Production Savings on a Wide Variety of Jobs

BESLY GRINDERS

The Besly No. 953-36" Vertical Spindle Wet Grinder, with changes in fixtures, faces 100 to 200 Mower Sections and Guard Plates per minute. Bevels the same pieces at the rate of 72 to 150 per minute.

The ability of Besly Grinders to make production savings is exemplified in this No. 953-36" Besly Vertical Spindle Grinder tooled for grinding various sizes and shapes of round and rectangular Alnico magnets on opposed surfaces. Production: 500 to 1200 pieces per hour with one operator; up to 2000 pieces per hour with two operators. Work is held to limits of plus or minus .001 inch for size, .002 inches for parallelism.

Adapted to your work, the "953" or other Besly Grinders may answer your production problem. Why not talk over your specifications and needs with a Besly engineer.

You'll Do BETTER with BESLY

Helpful Facts on Abrasive Wheels

Write for this free booklet...It contains valuable information on grinding wheels and abrasives. Get the facts about Besly Titan Steelbacs—they save "down time" and step up production.

BESLY GRINDERS AND ACCESSORIES
BESLY TAPS • BESLY TITAN ABRASIVE WHEELS

CHARLES H. BESLY AND COMPANY • 118-124 N. Clinton St., Chicago 6, Ill. • Factory: Beloit, Wis.

SAVE ½ OR MORE on your carbide tool costs

INCREASE production per tool 3 to 10 TIMES

Another typical job!

Part machined: Rotor Hub
Machine: New Britain-Gridley
Material: Cast Iron (very tough)
Operation: Turning
Depth of cut: .030"
Feed: .020"
Speed: 250 f.p.m.
PIECES PER GRIND: 5700 plus
Best previous carbide: 1800 average (2100 max.)

TECO Grade A-1 used

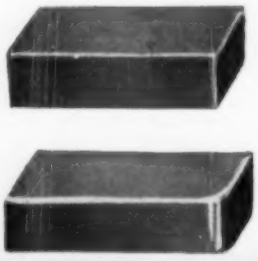
Improved TECO Cemented Carbide is not offered as a "cure-all", nor as the solution to "freak" machining problems.

But—wherever you are running an established, high-production carbide job—turning, boring or facing—you should be able to duplicate the great production increases shown in other plants.

The only way to know, is to tool up a machine with Improved TECO and compare pieces per grind—grinds per tool—tool costs, with your present carbide. Then, run at higher speeds and feeds for an additional surprise.

Send us details of your machining problem to insure the correct TECO tools or blanks for your needs. Catalog and price list on request.

TUNGSTEN ELECTRIC CORPORATION 570 39th Street, UNION CITY, N. J.
Branch Office: 403 Western Reserve Bldg., Cleveland 13, Ohio Representatives: Indianapolis, Ind., Chicago, Ill., Detroit, Mich.



Manufacturers of
TECO CARBIDE BLANKS and TOOLS

All standard sizes and styles. When ordering any carbide tools specify "Teco —no substitute."

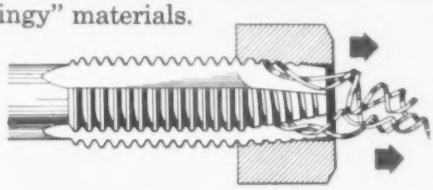
Improved
TECO
CEMENTED CARBIDE

Manufacturers of Tungsten Carbide—from ore to finished material—for over a quarter century.

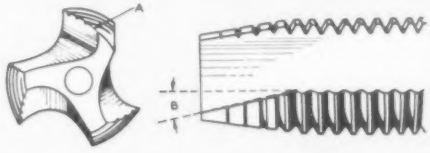
Facts about "GUN" TAPS

In the old days, most taps broke before they wore out.

Then, for machine use, GTD "Greenfield" brought out the "Gun" Tap – a radical change in tap design. The "Gun" Tap "shot" the chips out ahead of the tap so that they didn't clog up in the flutes. This was especially important in tapping "stringy" materials.



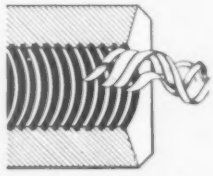
Note the design features of the "Gun" Tap in the illustration below. Cutting edges (A) at the point of the tap are ground at an angle (B) to the axis for four or five threads. This angle, plus a hook on the cutting edge of the land and the special flute form – makes long curling chips that shoot out ahead of the tap.



RESULT: a "Gun" Tap does not require deep flutes for elimination of chips. Therefore, fewer and shallower flutes are possible, insuring a large cross sectional area. This gives **EXTRA STRENGTH.**

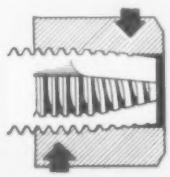
"GUN" TAP

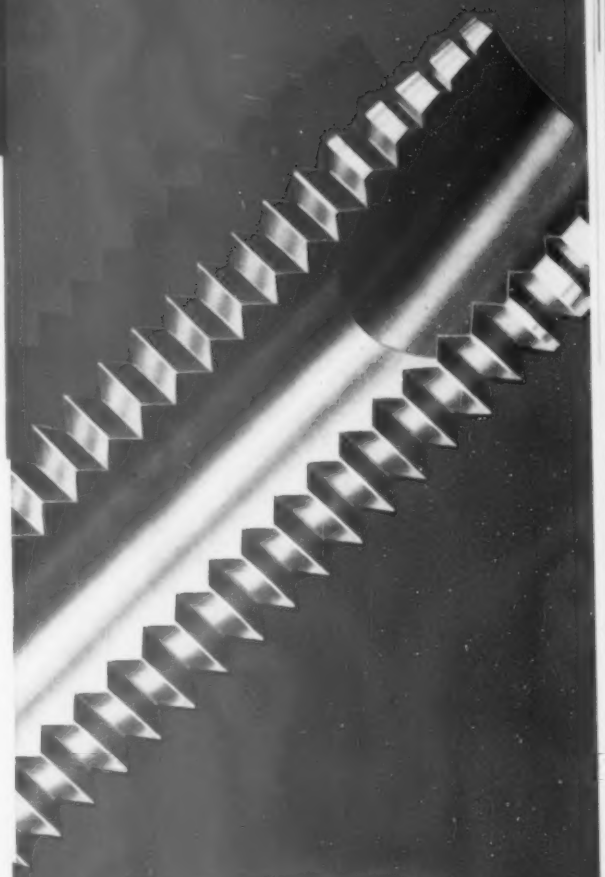
4 FLUTED HAND TAP



And much **LESS POWER** is needed to drive the tap because it shears the metal instead of tearing or pulling it off with a scraping action.

Also a "Gun" Tap gives greater **ACCURACY** because the first few teeth do the cutting so that the rest of the threads can serve to steady the tap in the hole.





GTD GREENFIELD

World's Leading **THREADING TOOLS**

When you buy GTD "Greenfield", you get a quality of product that comes from the world's largest, most modern threading tool plant and its research staff of threading engineers – PLUS SERVICE from the leading distributors and GTD "Greenfield's" field men in every industrial center.

GREENFIELD TAP and DIE CORPORATION GREENFIELD MASSACHUSETTS

Hardness as Specified! IN DIE RINGS OF LEHIGH H

Rheem operator making a Rockwell-hardness test on one of the three Lehigh H die rings. The uniform results obtained are described below.

Dow Chemical Company needed three die rings for the high-production blanking of 24-gage covers for carbide drums. Each ring had to be within close tolerances and show a Rockwell-C hardness of 61 to 63.

The Stockton, Calif., plant of Rheem Manufacturing Company made the rings from Lehigh Die and Tool Steel (H Temper). Each finished ring was given a Rockwell test (C-scale) at four points with the following results:

1st ring—61, 62, 61, 61
2nd ring—62, 62, 63, 62
3rd ring—62, 62, 61, 61

These results indicate accurate and uniform working hardness—one feature of this popular steel.

Lehigh H is the air-hardening type of high-carbon, high-chromium tool steel, with the following distinct advantages:

- Minimum distortion
- High abrasion-resistance
- Shock-resisting
- Safe and uniform hardening

Use Lehigh H wherever severe service and long runs are called for. Use it for tools and dies for blanking, punching, forming, shearing . . . and for gages, taps, hobs, and mandrels. Lehigh H is available in a wide range of sizes and shapes for immediate shipment.

★ BETHLEHEM STEEL ★

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export distributor: Bethlehem Steel Export Corporation

LEHIGH H . . . one of Bethlehem's fine tool steels

6-TON thrust loads and 1-TON radial loads can't budge tools gripped in UNIVERSAL COLLET CHUCKS

Universal Collet Chucks grip tools TIGHT! They hold end mills, taps, drills, and reamers positively rigid under 6-TON THRUST LOADS and 1-TON RADIAL LOADS. Special design produces *precisely equalized gripping power*—not at just a few points, but ON A CONTINUOUS SURFACE. That means you can use heavier feeds and greater speeds in your machining operations when you use Universal Collet Chucks—*you can turn out more work in less time.* Universal Collet Chucks grip tool flutes, permit stubbing, which eliminates cutting drills, thereby increasing profits. The Universal Collet Chuck is tightened so easily that LOCKING EFFORT IS REDUCED 50%. For faster, more accurate milling, drilling, reaming, and tapping in your plant, it will profit you to use Universal Collet Chucks. *Write for complete information.*

UNIVERSAL TOOLS THAT WILL INCREASE PRODUCTION AND EFFICIENCY IN YOUR PLANT

UNIVERSAL ENGINEERING COMPANY • **FRANKENMUTH, MICHIGAN**

BROACHES
AND BROACHING FIXTURES
Exclusively!

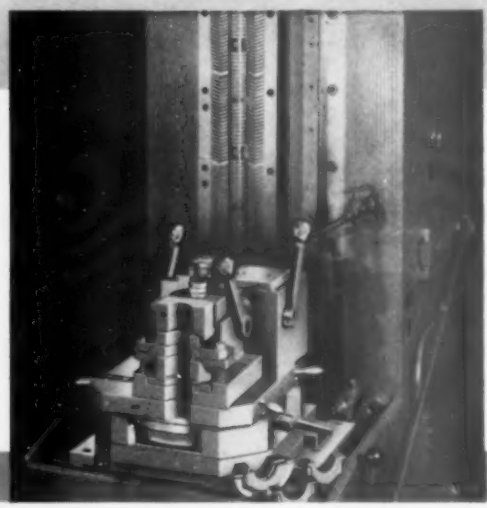
for
EVERY MAKE and MODEL BROACHING MACHINE..
for
EVERY APPLICATION

Detroit Broach Company manufactures broaches and broach tooling exclusively . . . for every type machine.

Through this specialization, the application and tooling of all types of broaching machines has become a thoroughly familiar procedure. This wide experience is used to aid you in the most efficient application of broaching machines for your jobs. Then, combined with the finest manufacturing facilities, this experience is applied to design and build broach tooling that will produce the most from every production-hour.

Have Detroit Broach consult with you on your broaching applications. We will gladly give you actual cost and production data for each job.

DETROIT *Broach* COMPANY
20201 SHERWOOD AVE. DETROIT 12, MICH.



SOUTH BEND 10" *Precision Lathes*

The 10" Swing, 1" Collet Capacity South Bend Precision Lathe is engineered for the most exacting close-tolerance machine work. The direct belt drive to the carefully balanced spindle assembly provides smooth, vibration-free speeds up to 1357 r.p.m. Slow speeds for heavy cuts on large diameters are driven through back-gears. Full quick change gear equipment makes any of 48 different threads and 48 different feeds instantly available.

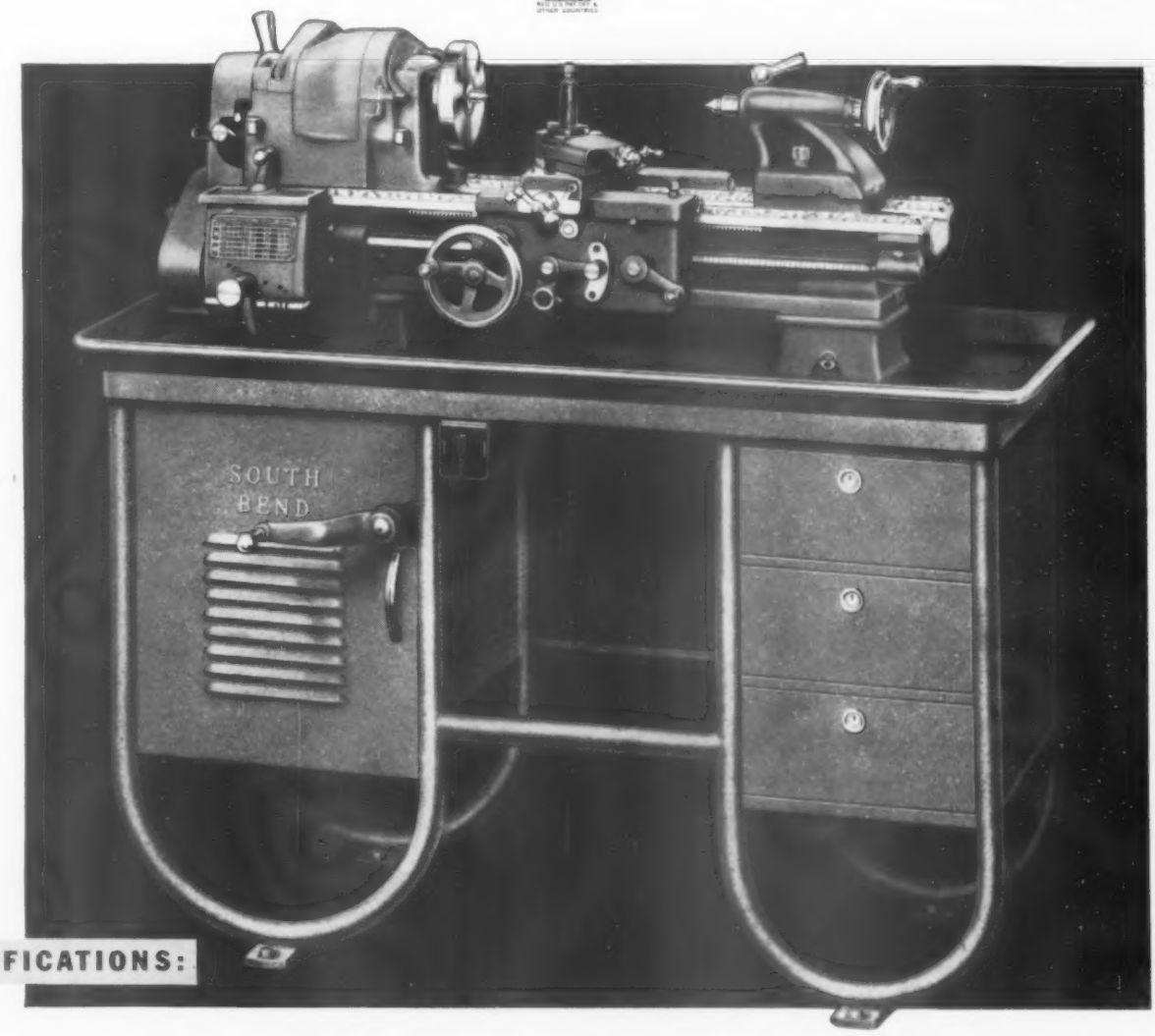
The precision, speed, and versatility of this lathe assures an efficient output on toolroom or manufacturing jobs. The 1⅜" bore through the head stock spindle makes it especially suited for machining parts from bar or tube stock. A complete line of practical attachments greatly simplifies tooling the lathe for a wide variety of operations.

South Bend Precision Lathes are made with 9", 10", 13", 14½", 16", and 16/24" swings. We also manufacture Turret Lathes with ½" and 1" maximum collet capacity, and 14" Precision Drill Presses. Immediate deliveries can be made and a Time Payment Plan is available.

SOUTH BEND LATHE WORKS

BUILDING BETTER TOOLS SINCE 1906

531 EAST MADISON ST., SOUTH BEND 22, INDIANA



SPECIFICATIONS:

Catalog No. 187-YS South Bend 10"-1" Collet capacity Quick Change Gear Bench Lathe illustrated. Price—f.o.b. factory with 3 ph., 60 cy., 220 v., A.C. motor; drum switch; and bench $933.60

SWINGS: 10⅛" over bed and saddle wings, 5¾" over saddle cross slide.

BED LENGTHS . . . 3, 3½, 4 and 4½ feet

CENTER DISTANCE . . 14¾ to 32¾ inches

COLLET CAPACITY . . . . . 1 inch

SPINDLE BORE . . . . . 1⅜ inches

12 SPINDLE SPEEDS . . 50 to 1357 r.p.m.

CROSS SLIDE TRAVEL . . . . . 5⅞"

COMPOUND REST TOP ANGULAR FEED: 2"

POWER LONGITUDINAL FEEDS: 48 R.H. or L.H. . . . . .0015" to .0836"

48 POWER CROSS FEEDS: .0006" to .0309"

THREAD CUTTING: 48 R.H. or L.H. pitches . . . . . 2—224 per inch

PRICE RANGE OF SOUTH BEND 10" PRECISION LATHES

Quick Change Gear Lathes . . $718 to $946

Toolroom Lathes . . . . . $994 to $1186

These prices f. o. b. factory, less electrical equipment

BAY STATE®

BAYFLEX®

Time saver—

money maker—

easier—

faster!—

—write them today!

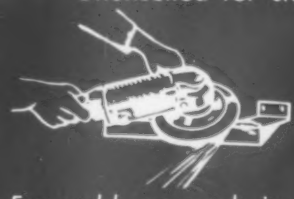
Foundry and metal-fabricating shop operators are overwhelmed with their increased piece work production from BAYFLEX RAISED HUB DISC WHEELS.

Yes, where heavy duty portable grinders and sanders are used the jobs can now be done much faster—easier—cleaner. No wonder that BAYFLEX is so popular with management and operators alike!

The merits of this new product are many . . . the production possibilities unlimited. To appreciate the full value of BAYFLEX however, you must see it in operation. Ask for a demonstration at your plant. No obligation.

Branch offices and warehouses —
Chicago — Detroit
Distributors — All Principal cities

Unexcelled for cleaning castings.



For welds on angle-iron frames.

For hard-to-get-at places.

Has no equal for smoothing welds.

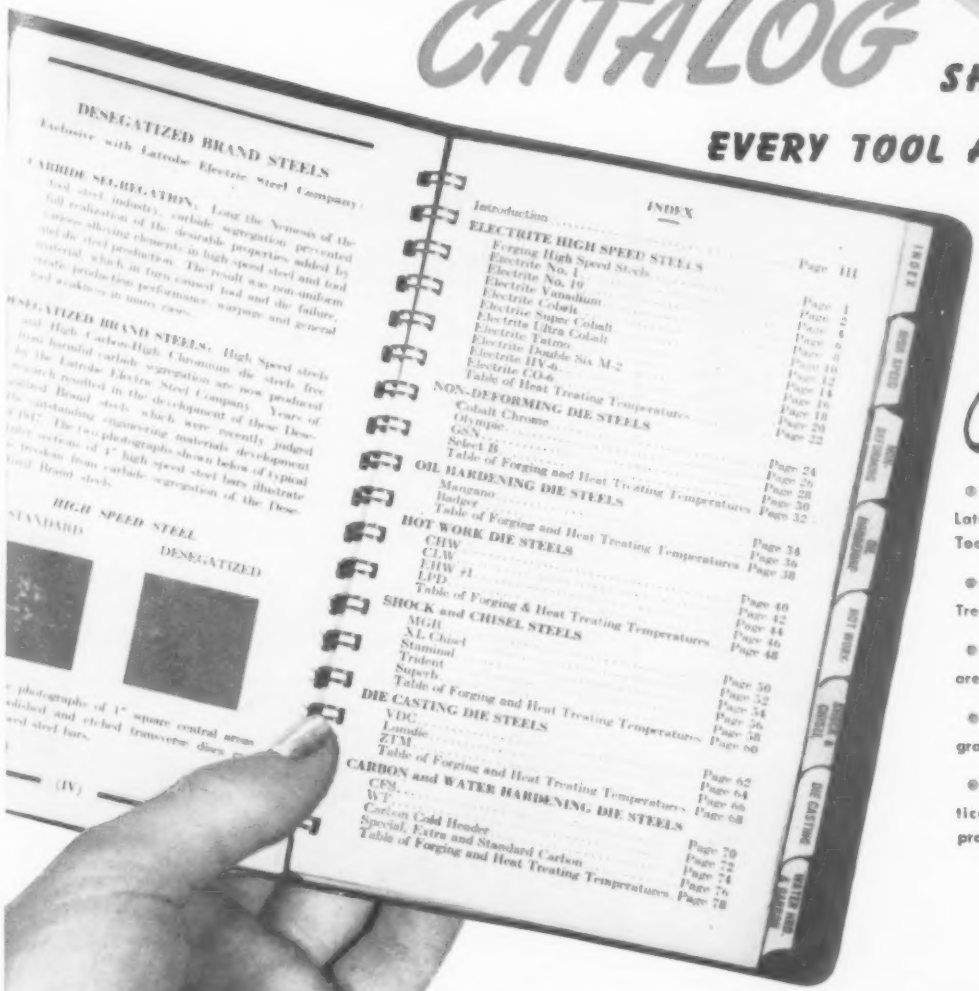
Hundreds of uses in auto repair shops.

A "MUST" for metal-fabricating shops.

Top Performance Consi

BAY STATE ABRASIVE PRODUCTS CO.,

This handy pocket size CATALOG SHOULD BE IN EVERY TOOL AND DIE SHOP



Contents

- Analyses and properties of Latrobe Electric Steel Company's Tool and Die Steels.
- Recommendations for Heat Treating.
- Forms in which these steels are furnished.
- Typical applications for each grade of steel.
- Useful tables and data of practical value in every-day shop practice.

Here, indeed, is a booklet that is far more than a mere catalog. It is published by Latrobe Electric Steel Co. as a service to shopmen, tool and die makers, foremen and engineers. It is replete with useful information in handy reference form and contains data and descriptions of popular Latrobe Electric Steel Company high-speed steels and tool and die steels.

Send for your copy—use the coupon below!

LATROBE
DESEGATIZED
BRAND OF DISPERSED-SEGREGATE
HIGH SPEED STEELS
TOOL & DIE STEELS

Latrobe ELECTRIC STEEL COMPANY
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Gentlemen: Please send me, without obligation, your catalog covering Latrobe Electric Steel Co. High-Speed Steel and Tool and Die Steels.

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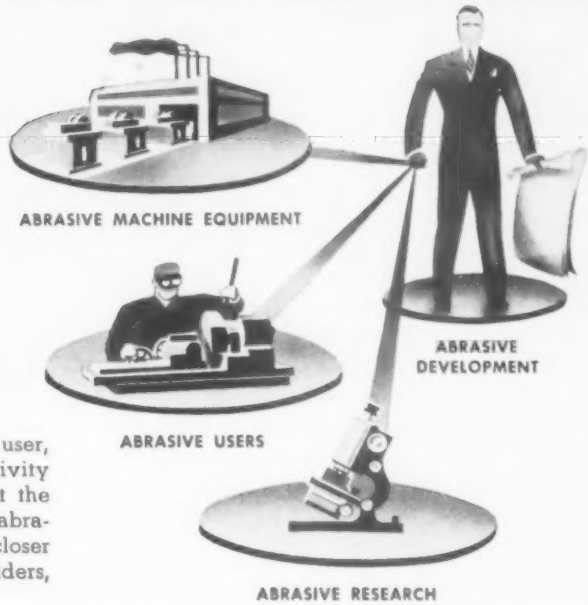
A BUYING GUIDE FOR ABRASIVES

ABRASIVE PROBLEM:

Is there a better abrasive or technique for the job?



ANSWER BY

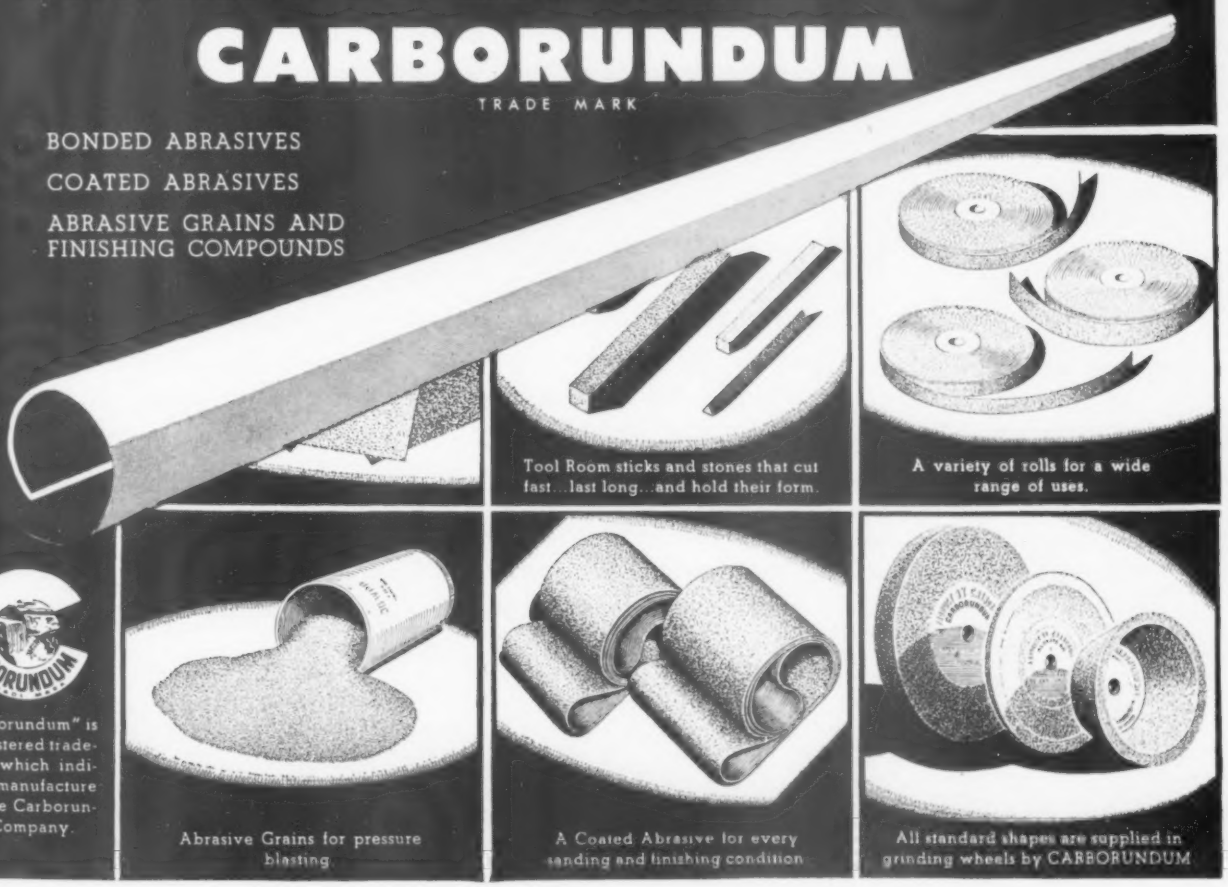
CARBORUNDUM
TRADE MARK

Key step between research and abrasive user, "Product Development" is an important activity at The Carborundum Company. Aimed at the development and application of the right abrasive in the right place, it brings about closer cooperation among abrasive machine builders, abrasive users, and our own research.

Products and techniques are rigidly tested and evaluated for both grinding wheels and coated abrasives. Suggestions are investigated and analyzed. Vital information is collected and interchanged. Facts and figures are checked and correlated. The net result is realized in more effective selection and application of abrasives ...another reason for preferring products by CARBORUNDUM. The Carborundum Company, Niagara Falls, New York.

CARBORUNDUM
TRADE MARK

BONDED ABRASIVES
COATED ABRASIVES
ABRASIVE GRAINS AND FINISHING COMPOUNDS



Tool Room sticks and stones that cut fast...last long...and hold their form.

A variety of rolls for a wide range of uses.

Abrasive Grains for pressure blasting.

A Coated Abrasive for every sanding and finishing condition.

All standard shapes are supplied in grinding wheels by CARBORUNDUM

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company.

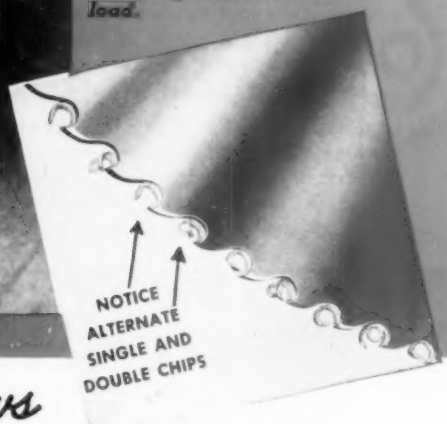
BREAK UP *Your Chip Loads..*
CASH IN ON FASTER FEEDS AND SPEEDS!

Triple-Chip METHOD

The M. & M. Hi-Lo principle provides alternate high and low teeth which form single wide and double narrow chips, respectively, dividing the load.

"HI-LO" PRINCIPLE

RESULT— TRIPLE CHIP



MOTCH & MERRYWEATHER *Slitting Saws*
GIVE GREATER SPEEDS AND LONGER TOOL LIFE

Motch & Merryweather's original dual drive equalizes stresses, gives plenty of driving power, and makes blade keyways unnecessary

M. & M. Slitting Saw Blades enable you to profit from record-breaking speeds and satisfying accuracy. They give you all the well known advantages of the Triple-Chip Method. The characteristic M. & M. curved, cam-generated tooth contour avoids clogging, since the curling chips are self-clearing. A generous gullet imparts great strength to the teeth. Result: faster cutting, longer blade service.

Exclusive dual drive design supplies positive driving power and protects the driving means; practically no blade breakage. Blades adaptable to arbors up to 1¼"; interchangeability conserves blade investment. Range of pitch in all diameters and thicknesses. Other big advantages, too.

Get well illustrated Bulletin "T-4"

Only M. & M. builds ALL 3: CIRCULAR SAW · SAW BLADE · BLADE GRINDER

THE MOTCH & MERRYWEATHER MACHINERY CO.
PENTON BUILDING • CLEVELAND 13, OHIO

CUTTING TOOL DIVISION

AT YOUR COMMAND · AN UNPARALLELED EXPERIENCE IN CIRCULAR SAWING

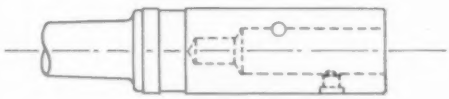
A New CUTTING TOOL SHANK - THE METCUT CLUTCH DRIVE

(NOT PATENTED)

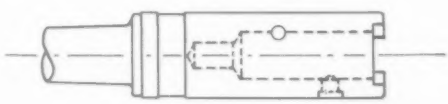
combines EXTREME STRENGTH with the QUICK CHANGE features of the pin drive.

FEATURING:

- **CLUTCH DRIVE**— for tremendous strength
- **PIN LOCK**— for easy, rapid change
- **HEAVY DUTY**— drives on largest diameter
- **QUICK CHANGE**— twist 1/4 turn to lock or unlock
- **ADAPTABILITY**— Pin Drive Holders may be altered for use with Clutch Drive Tools. (See sketches)



Pin Drive Holder can be altered to Clutch Drive Holder by Cutting In the Clutch.



Pin Drive, as well as Clutch Drive Cutters, can be used in Clutch Drive Holders.

Specifications sent on request. Let us quote on your tool requirements.

METCUT **METAL CUTTING TOOLS, INC.**
ROCKFORD, ILLINOIS

A Cost-Cutting DOUBLE PLAY

VICKERS to GREENLEE to Kelvinator

This 24-station, 152-tool Automatic Transfer Processing Machine was built by Greenlee Bros. & Company to aid Kelvinator in reducing the cost of machining refrigerator compressor bodies. With the many machining operations involved on these high-production parts, work handling is as important as metal cutting in obtaining a low cost.

All functions of the machine are accomplished with the aid of Vickers Hydraulic Equipment . . . and all of the pumps and control valving were supplied to Greenlee by Vickers. Two types of pumps are used in the installation for transfer and unit head operation. The pump for operating the unit heads is shown at the right.

Consult the Vickers Sales Engineering office in your area for information on how Vickers Hydraulic Equipment can be applied to meet your requirements.

VICKERS INCORPORATED • 1416 OAKMAN BLVD. • DETROIT 32, MICH.

DIVISION OF THE SPERRY CORPORATION

Sales Engineering and Service Offices: ATLANTA • CHICAGO • CINCINNATI • CLEVELAND DETROIT • LOS ANGELES • NEWARK • PITTSBURGH • PHILADELPHIA • ROCKFORD • ROCHESTER • SEATTLE • ST. LOUIS • TULSA • WASHINGTON • WORCESTER

Engineers and Builders of Oil Hydraulic Equipment Since 1921

VICKERS BALANCED VANE TYPE PUMP

This efficient and dependable source of hydraulic power has a number of extraordinary advantages that improve the product upon which it is used. The exclusive *hydraulic balance* construction prolongs pump life by entirely eliminating bearing loads resulting from pressure. Automatic wear take-up is provided without appreciable change in performance and correct running clearance is automatically maintained throughout wide temperature range with its resulting differential expansion of pump parts. For the many other features, ask for Bulletins 38-14 and 40-25a.

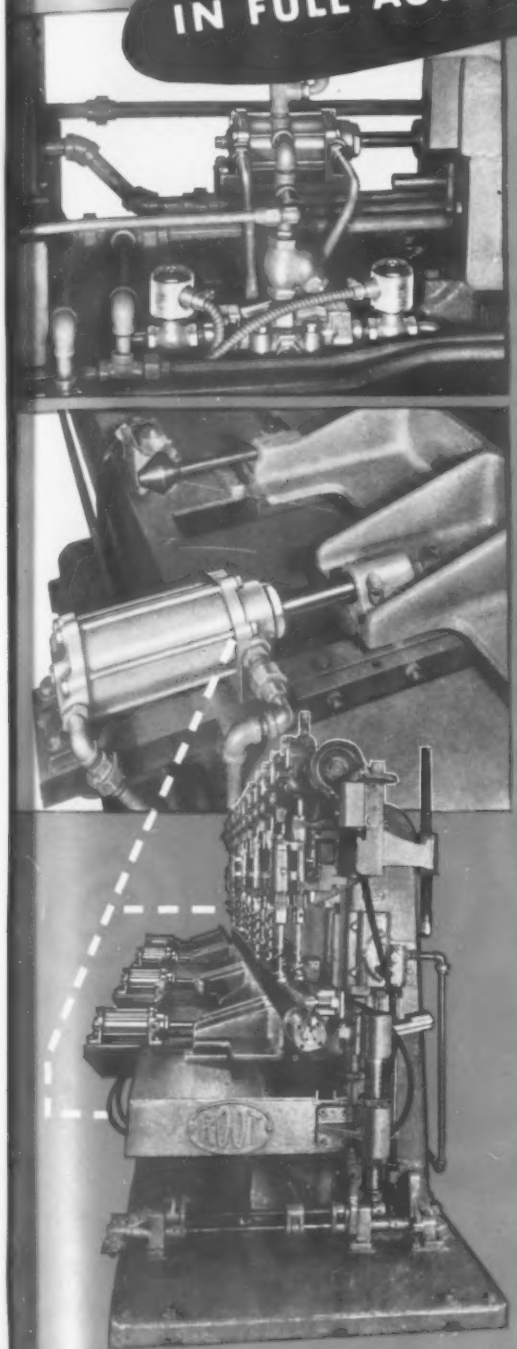
3435

2 "LOGAN" SOLENOID AIR VALVES Control

4 LOGAN AIR CYLINDERS *for Clamping and Unclamping the work*

1 LOGAN AIR CYLINDER *for Starting and Reversing the Hydraulic Table Feed*

IN FULL AUTOMATIC CYCLE ON SPECIAL MACHINE



Photos courtesy of B. M. Root Co., York, Pa.

All movements of this special machine are automatically controlled in sequence by means of two Logan solenoid air valves of the bleeder-operated type. The cycle is as follows:

1 The work moves through a channel until it strikes the end stop and trips an electric control switch.

2 *One* Logan electric solenoid operated air valve activates *four* Logan air cylinders simultaneously to clamp the work. At the end of the clamping movement, a cam trips an electric limit switch (center photo).

3 A second Logan electric solenoid operated air valve then activates the fifth Logan air cylinder (top photo), automatically starting the foot trips which control the hydraulic table feed.

4 The table moves upward, feeding the work to the cutters. Multiple wood boring operations are performed simultaneously on telegraph pole cross arms.

5 As the table feed movement is completed, another limit switch is tripped, and the second air valve reverses the table movement. This trips still another limit switch, operating the first air valve and releasing the clamping fixture so the workpiece can be unloaded.

APPLY THESE ADVANTAGES TO YOUR WORK

Get greater speed, accuracy and efficiency in your plant and on your products . . . use Logan Air Valves for manual or foot, remote, automatic, semi-automatic, interlocking or sequence control of cylinder movements. Call on Logan engineers for circuit recommendations. No obligation.

Write for FREE literature on Logan air valves, cylinders and accessories.

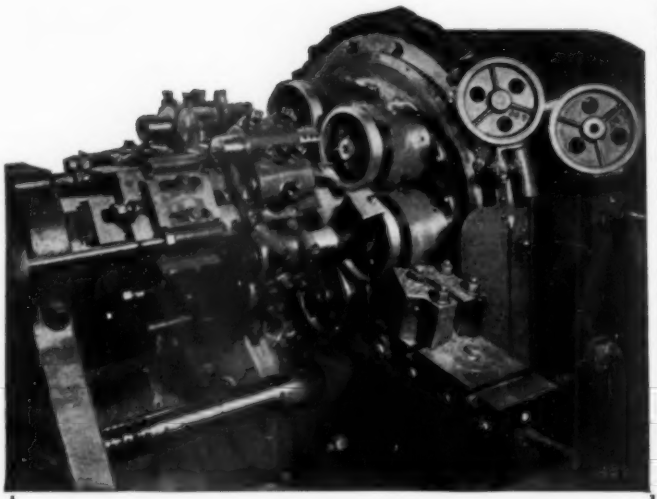
Logan SAVES ★TIME ★EFFORT ★MOTION

Air and Hydraulic Equipment

LOGANSPORT MACHINE CO., INC.

931 CENTER AVE. LOGANSPORT INDIANA

CHUCKS • CYLINDERS • VALVES • PRESSES • SURE-FLOW COOLANT PUMPS



GEAR BLANKS ARE TURNED ACCURATELY AND SPEEDILY ON

"BAIRD" AUTOMATIC CHUCKING MACHINES

Here is shown a "Baird" No. 76H Chucking Machine, set up for turning, facing and boring gear Blanks made of a Special Cast Iron having a Rockwell hardness—85—90 B Scale.

The O.D. is finished turned to 6.800 plus or minus .001 and both faces are finished to 1.000 width, plus or minus .001.

The Hole is finished bored and reamed .750 diameter to plug gage and is concentric with the O.D. turning within .001 total indicator reading.

The work is held in Standard "Baird" Three Jaw Contracting Chucks, using stud type jaws for gripping. (The Spindle Turret is shown partially indexed to better illustrate the method of chucking.)

This gear is completely turned as shown to the required accuracy at the rate of 55 pieces per hour.

Selection of a spindle speed for each position, which is a special Baird Feature, permits high Spindle speeds in the finishing positions where carbide tools are used to produce the fine accurate surfaces required.

When you have Turning Operations that should be done profitably

"ASK BAIRD ABOUT IT."

THE BAIRD MACHINE COMPANY
STRATFORD, CONN.

There IS a Difference In Gages

Are You Getting "Root Relief"

REPUBLIC'S cleared major diameter of the ring gage permits the maximum number of resets and reworks at a minimum cost. REPUBLIC'S method guarantees that the relief will be centered in the thread root. Rings over ⅞" have a ground relief, which resists the adhering and wedging of dirt.

REPUBLIC'S rings with "THAT UNSEEN EXTRA QUALITY" cost no more

RELY ON REPUBLIC

REPUBLIC GAGE

DETROIT 21, MICHIGAN

Columbia TOOL STEEL

NO SHORTAGE—

Columbia Tool Steels can be purchased for immediate delivery from all-time large stocks or from Mill without unusual delay.

—And at no price premium

COLUMBIA TOOL STEEL COMPANY

ARTHUR T. CLARAGE, PRESIDENT
MAIN OFFICE AND WORKS

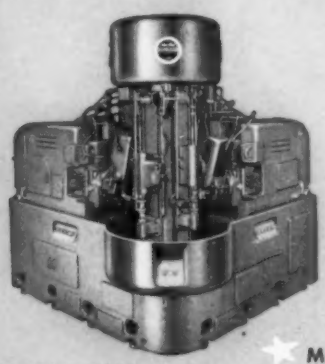
520 EAST 14TH STREET • CHICAGO HEIGHTS, ILL.

Red Ring Rotary Gear Shaving Machines

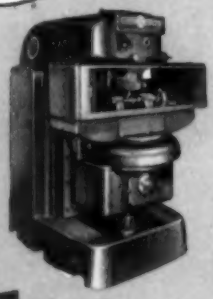
FOR SPUR AND HELICAL GEARS

★ The Elliptoid tooth form may be shaved on these machines.

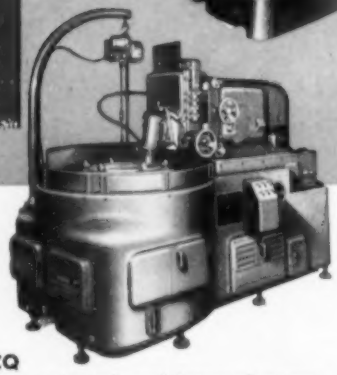
Model GCL FINE PITCH SHAVER for external gears 3/16" to 4" PD.



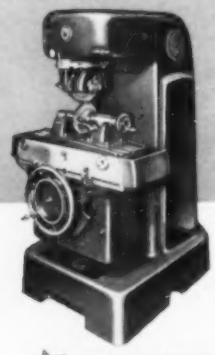
★ Model GCS TURMATIC (2 Sizes) for external gears 3/4" to 12" PD.



★ Model GCU DIAGONAL (2 Sizes) for external gears from 1" to 12" PD.



Model GCQ (3 Sizes) for external and internal gears 5" to 48" PD.

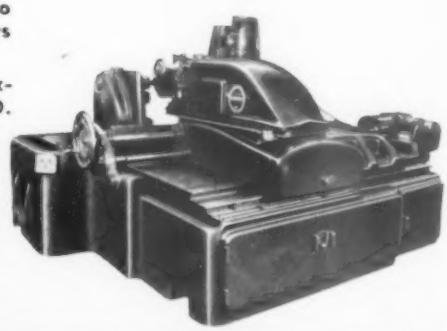


★ Models GCI (3 Sizes) for external gears 1/2" to 18" PD and internal gears 3" to 18" PD.

★ Model GCP for external gears 3" to 24" PD.

Model GCR for internal gears 3" to 12" PD.

Model GCK (2 Sizes) for external gears 24" to 160" PD.



★ Model GCJ for external gears 4" to 36" PD.
Model GCM (2 Sizes) for external gears 4" to 48" PD.

Write for descriptive bulletin on the machine in which you are interested.

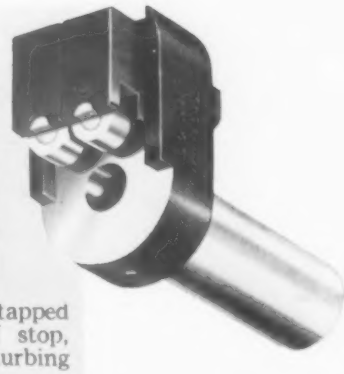
NATIONAL BROACH AND MACHINE CO.
5600 ST. JEAN • • • • • • • DETROIT 13, MICHIGAN

TWO *New* SCREW MACHINE TOOLS

MODEL AT
Non-Releasing Adjustable TAP HOLDER

Correct alignment of taps between turret and work spindle is quickly possible with this new Tool. Simply set and tighten two screws. Permits adjustment of as much as $\frac{1}{16}$" for any misalignment in machine. Moving parts enclosed. Smooth running and long wearing. In 3 Sizes.

MODEL RR
ROLLER REST



A Tool to replace the old fashioned solid support. Eliminates marring of piece parts and wear that causes variation in diameters. Adjustable rollers permit closer tolerances over long runs. Shank is tapped to permit adjustment of stop, drill or reamer without disturbing set-up of tool. In 2 Sizes.

BOYAR-SCHULTZ

SCREW MACHINE TOOLS for Full Time Production of Quality Piece Parts

Your screw machines are geared to maximum production only when equipped with Screw Machine Tools that can bring out FULL production possibilities. And FULL production also includes accuracy that insures a minimum of rejects.

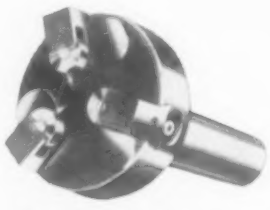
It is with this in mind that all Boyar-Schultz Screw Machine Tools are designed. They are made from the finest materials with expert workmanship and incorporate many outstanding features that assure high precision production.

Model K Knurling Tool

Designed to operate from the turret for difficult knurling operations behind and between shoulders. In 3 Sizes.

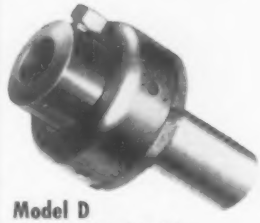
Model DRH Adjustable Drill and Reamer Holder

A precision made Tool designed for easy adjustment and saving in set-up time. Resists strains and impact. In 3 Sizes.



Model C Burnishing Tool

For producing a finish smoother than the usual machined surface. In 3 Sizes.



Model D Floating Tool Holder

For very accurate reaming. Full floating feature corrects misalignment that so often occurs between tool and work. Made in 8 Sizes.

Model G Universal Tool Bit Grinding Fixture

For grinding screw machine tool bits with precision exactness. Any particular grind can be duplicated singly or in quantity.

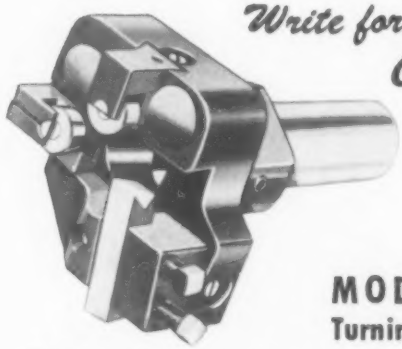
Model RS Revolving Stop

Quality made with a free turning head. Gives greater uniformity in piece part lengths. Prevents marring of parts. In 3 Sizes and 7 lengths.

BOYAR-SCHULTZ CORPORATION

2104 WALNUT STREET • CHICAGO 12, ILLINOIS

Write for Complete Catalog



MODEL T Turning Tool

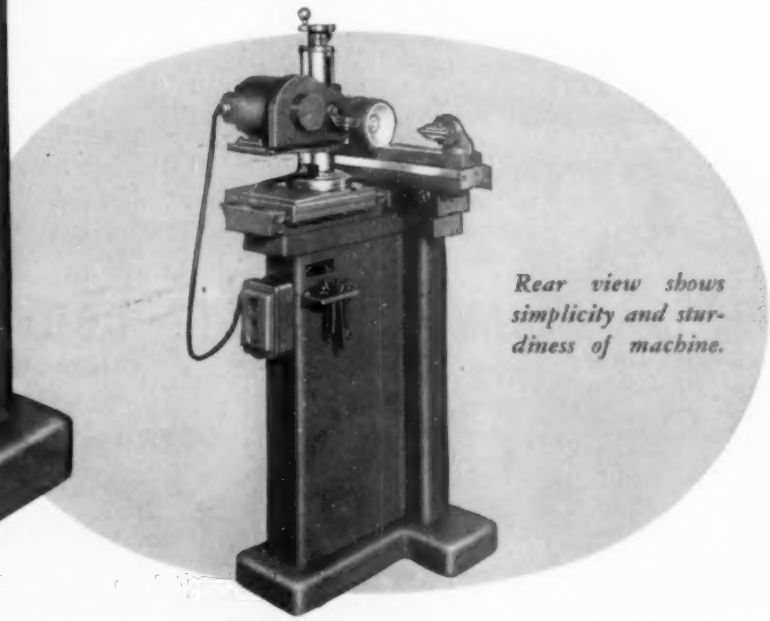
Designed for very close tolerance work and made with built-in strength that holds adjustments through long runs. In 7 Sizes.

DEVELOPED TO SAVE YOU MONEY

THE NEW No. 5 CUTTER AND TOOL GRINDING MACHINE

UNIQUE FEATURES

- Double-ended ball bearing wheel spindle (super-precision, permanently-sealed, grease-lubricated bearings).
- Ingenious, roller-bearing table.
- 4-location table crank or knob.
- Hollow, one-piece base, mounted on 3 points to preserve alignment.
- Additional equipment: Indexing equipment; Raising Blocks; Formed Cutter Sharpening Equipment; Collets for No. 5 & No. 7 B & S Taper Shanks; Draw-in Bolt; 3/8" and 3/4" Cutter Bars.



Rear view shows simplicity and sturdiness of machine.

Centers swing 6 3/8" in diameter. Distance, center line of work to center of wheel spindle, greatest 8 1/8", least, 1 5/8". Distance, center of wheel spindle to top of table, greatest, 6 7/8": least, 1 3/8". Write for complete specifications. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

BROWN &

ON CUTTER AND TOOL GRINDING

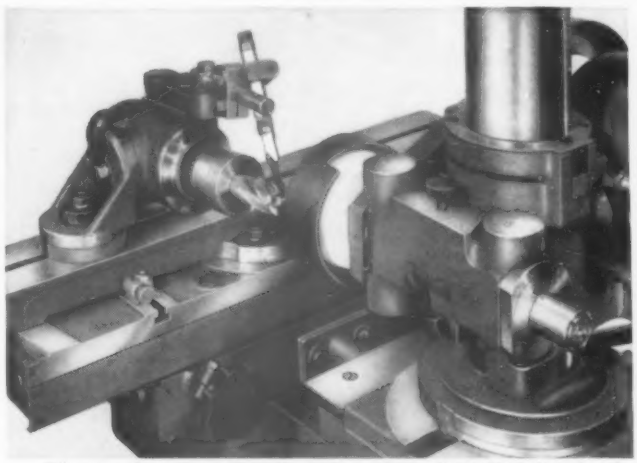
NEW OPPORTUNITIES

are now available for important improvements in your tool room efficiency through the compact, versatile and extremely sensitive Brown & Sharpe No. 5 Cutter and Tool Grinding Machine. It is specifically designed to handle a large share of tool room sharpening jobs . . . all types of small cutters, especially end mills . . . also reamers and similar tools. Handy in size and unusually flexible, it simplifies and speeds up cutter and tool sharpening.

Easy-gliding, roller-bearing table makes operation extremely simple and accurate.

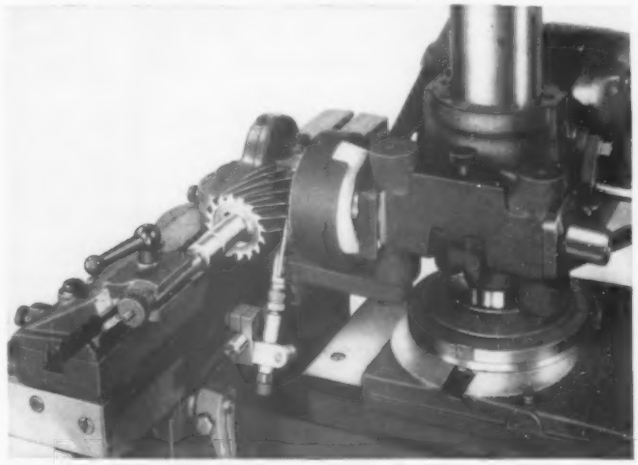
✓ SAVE ON SET-UPS AND OPERATION

The super-sensitive operation of this No. 5 machine . . . readily responsive to a light touch from the operator . . . makes set-ups and operation fast and easy. It is the result of an ingeniously-designed table which slides on 36 precision-ground rolls . . . plus lighter weight parts, engineered for fast and accurate sharpening. Most desirable work center height, conveniently located controls, and small machine size also facilitate set-ups and operation.



Sharpening End Teeth of Spiral End Mill (above).

Sharpening Plain Milling Cutter (below).



✓ SAVE ON FLOOR SPACE AND INVESTMENT

For a moderate investment, the No. 5 Machine will do much of the work that has been done frequently on larger, more expensive machines. On the basis of smaller overhead and space alone, it will reduce the unit cost of sharpening many cutters and tools.

SHARPE

B·S

the grinding job

Centerless grinding seamless steel tubing 2½" outside diameter, ⅛" wall thickness, 18" long on a Landis Tool Company No. 12 Centerless Grinder, through feed, 15 micro-inch-finish. Cool grinding action is essential to prevent heating and distortion of the piece.

the wheel

Borolon Vitrified centerless grinding wheel A60-L6-V1, size 20" x 6" x 12". Selected for cool, fast grinding combined with long wheel life . . . ideal for production runs. Grain and grade combinations can be varied to meet the requirement of any specific circumstance of use.

Borolon ALUMINUM OXIDE — *Electrolon* SILICON CARBIDE

SIMONDS ABRASIVE CO.

PHILADELPHIA, PA.

Grinding Wheels

Complete line includes every shape and size.

Abrasive Grains

Mounted Wheels and Points

Surfacing Segments

Bricks and Sticks

where to get it

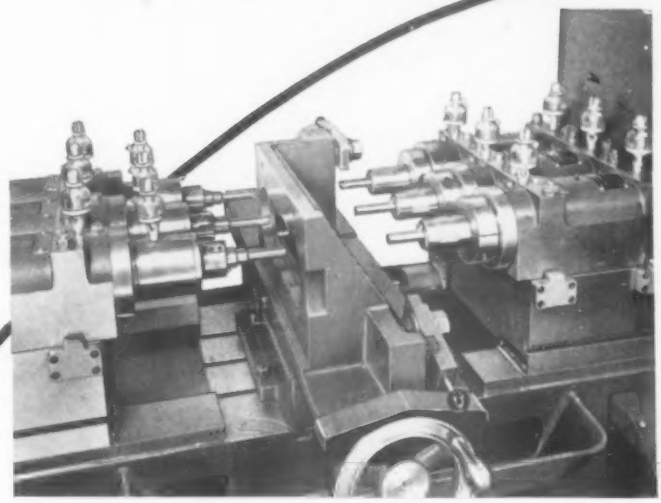
Simonds Abrasive Distributors in all principal industrial centers of the U. S. and many foreign countries carry stocks and can advise on grinding wheel selection. Write today for Technical Manual on Centerless Grinding. Also for name of nearest distributor.

For over 50 years Simonds Abrasive Company has been a major manufacturer of grinding wheels and abrasive products exclusively. From the crude abrasive produced by Simonds Canada Abrasive Company Ltd., to the finished wheels manufactured in our modern Philadelphia plant, complete quality control governs every phase of processing and manufacture. That is why you can count on top wheel performance on every grinding job from roughing to finishing—efficient wheel action consistently repeated each time you buy Simonds Abrasive Company grinding wheels.

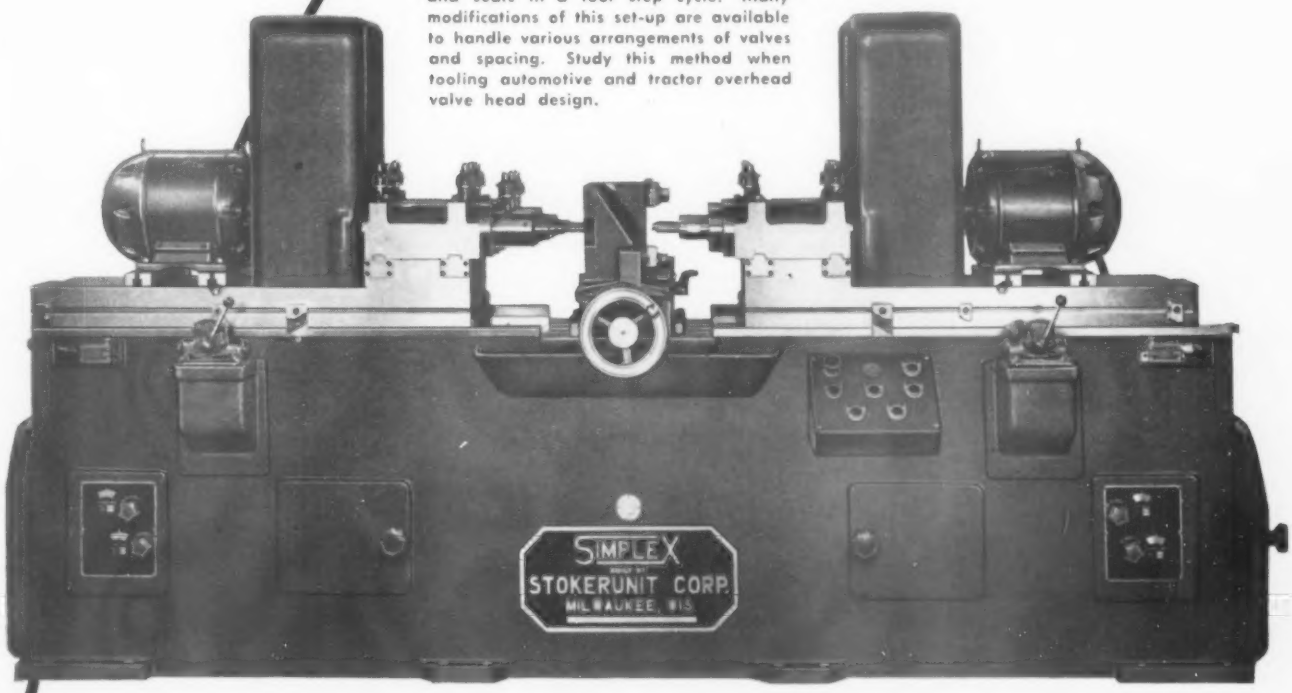
SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES

SIMPLEX

The life and efficiency of a gasoline engine depends much upon the accuracy of valves and valve guides. One progressive manufacturer found that by placing the cylinder heads for an overhead valve engine in a simple cross-sliding fixture, semi-finish boring one side and precision boring the valve guides and valve seats from the other, he achieved the finest precision and engine performance.



This SIMPLEX 2U 2-way Precision Boring Machine, with three #1 spindles on each side and cross-sliding fixture, bores two intake and two exhaust valve guides and seats in a four step cycle. Many modifications of this set-up are available to handle various arrangements of valves and spacing. Study this method when tooling automotive and tractor overhead valve head design.



Precision Boring Machines

STOKERUNIT CORPORATION

SIMPLEX Machine Tools Division

4528 West Mitchell Street, Milwaukee 14, Wisconsin

Precision Boring Machines, Planer Type Milling Machines and Special Machine Tools

Dollar Savings – *and the success of the job* often "turn" on using the right kind of a Center in your Lathes, Grinders, Hobbing, Hand Screw or Special Machines.

When you use Scully-Jones Centers you get accuracy and long life, because, in all sizes, they are ground to tinier-than-a-pin-point concentricity of .0002"—and are scientifically heat-treated. You can repoint them many times, because there is ample projection beyond the size line.

You get extra long life with Scully-Jones *Solid* High-Speed Steel Centers because they are made from Tungsten H. S. Steel (18-4-1 anaylsis) heat-treated to 63-64 Rockwell "C".

You can safely repoint our Tipped Centers as they have large brazed inserts. You get less burring and nicking because their shanks are 8641 Steel, carefully heat-treated for toughness.

Equip your machines now with these Scully-Jones Centers that will meet all your requirements: (1) Tungsten Carbide Tipped Centers (2) Stellite Tipped Centers (3) Solid High-Speed Steel, Plain and Half Centers (4) Carbon Steel Centers (5) Special Centers made to your requirements. Furnished with Morse, Jarno or Brown & Sharpe Tapers in all popular sizes.

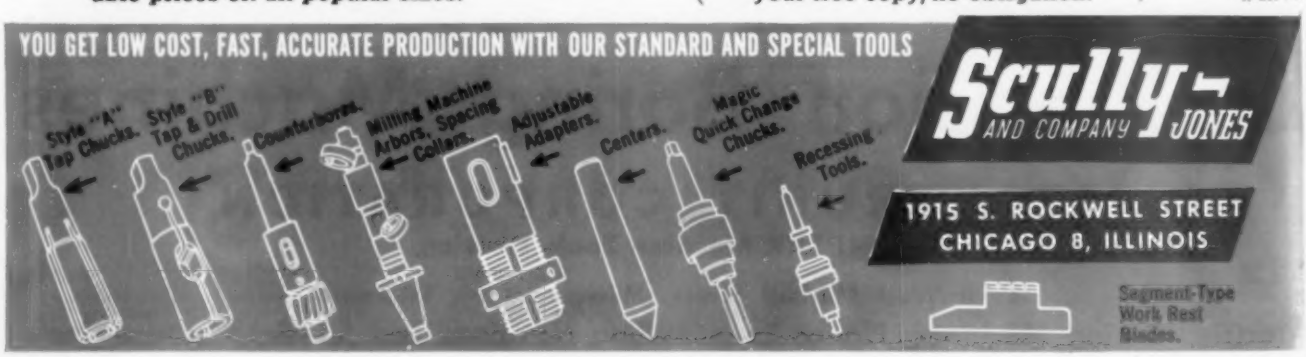
For complete information refer to pages 302-307 of Scully-Jones Tool Engineering Manual 500 and discount sheet dated March 15, 1947.

IMMEDIATE DELIVERY

You can get *immediate delivery* at reasonable prices on all popular sizes.

FREE ***Valuable Chart***
showing center dimensions for light and heavy work. Write today for your free copy; no obligation.

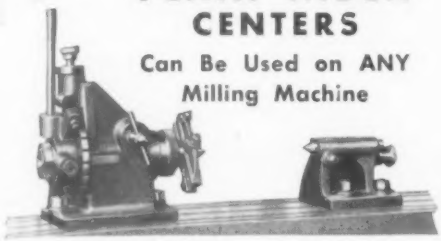
R-2674-R



CUT MILLING COSTS with KEMPSMITH STANDARD ATTACHMENTS

PLAIN INDEX CENTERS

Can Be Used on ANY Milling Machine



KEMPSMITH ARBORS in all popular sizes or types. Adaptable to ANY make of milling machine with standardized spindle.

Kempsmith Plain Index Centers for production and general indexing . . . simplify job set-ups . . . relieve the operator of the necessity of counting or making any calculations. Indispensable in milling taps, reamers, small gears, sprocket wheels, special grooving, etc. Described in Bulletin No. 124.

Kempsmith Standard Attachments broaden the scope of your milling machine . . . lower capital investment . . . save in set-up time.

KEMPSMITH MACHINE CO.
1847 SOUTH 71ST STREET
MILWAUKEE 14, WIS., U.S.A.

KEMPSMITH

Precision Built Milling Machines Since 1888

A 5375-14

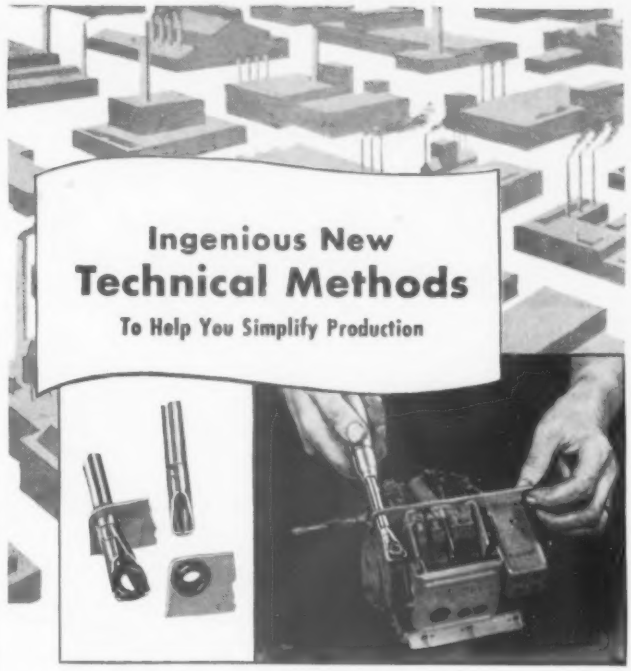
ARMSTRONG

Drop Forged "C" CLAMPS

More Reliable . . .

Every characteristic essential to absolute reliability is built into ARMSTRONG Drop Forged "C" Clamps—maximum strength, extreme stiffness, extra large Tempered and Tested Screws, better "Tool Sense" and design. That is why it is a good policy to standardize on ARMSTRONG "C" Clamps. . . . As one of the 9 major ARMSTRONG lines your local dealer carries ARMSTRONG "C" Clamps in "Heavy Duty", "Medium Service", "Extra Deep Throat", "Spatter Resisting" and "Toolmakers" designs, in a wide range of sizes.

ARMSTRONG BROS. TOOL CO. "The Tool Holder People" 323 W. Armstrong Ave. CHICAGO 30, U.S.A.
NEW YORK • SAN FRANCISCO



Ingenious New Technical Methods

To Help You Simplify Production

New Tool Inserts Rubber Grommets Quickly . . . Easily!

A new tool called a Grommet Inserter is shown above inserting a rubber grommet in a Sub-Chassis of a Zenith 7H820 Table Model Radio. The inset illustrates a close up view of the Grommet Inserter before and after the grommet has been inserted.

Anyone can insert grommets in an instant with the new Grommet Inserter. Saves time, labor, and assures perfect fit. No longer is it necessary to use the time-consuming, cumbersome method of insertion by hand. The new Grommet Inserter does it efficiently.

Grommet Inserter

Simple as A-B-C. All you do is push the Grommet Inserter through the hole, open jaws, place grommet in jaws, and pull back—leaving grommet firmly in place, and perfectly fitted. Comes in four standard sizes: 1/4", 5/16", 3/8", 7/16". Can be furnished in any special sizes to order.

You can count on chewing gum, too, to help step up employee's on-the-job efficiency. Chewing gum helps relieve tension and thereby enables him to work quicker and easier while leaving hands free. That's why more and more plant owners are making Wrigley's Spearmint Gum available to everyone.

Complete details may be obtained from
D. B. Rich Manufacturing Co.
6217 Melvina Ave., Chicago 30, Illinois

AC-62

STANDARD TOOL HOLDERS
for
ALL AUTOMATIC
SCREW MACHINES

A great many screw machine users come to us with their *toughest problems* in designing tool holders. So well have we been able to satisfy their needs—often with one of our standard tool holders—that many standardize on our holders. They like the added advantage of our standard holders being interchangeable with present equipment without altering machine or tool.

You too will find that our flat, dovetail, and circular tool holders perform a great many operations easier, quicker, more accurately. Deep keys and close tolerances guarantee alignment with the machine. Greater care in design makes them more convenient—easier to install. And the fact that we have over 400 models in stock makes deliveries quicker, costs lower.

SCREW MACHINE TOOL CO.
17565 SWIFT AVENUE
DETROIT 3, MICHIGAN

Index of Tool Engineer Advertisers

April, 1948

EX-CELL-O CAN GIVE YOU *Economical* PRODUCTION

Above: Wrist pin holes of aluminum alloy pistons are rough and finished precision bored on the Ex-Cell-O Automatic Piston Boring Machine shown below.

Above: Ex-Cell-O Automatic Piston Boring Machine. Chute at front delivers finished work to conveyor at rate of 200 pistons per hour net.

Ex-Cell-O Piston Boring Machines Cut Unit Costs with Fully Automatic Operation

One solution to the problem of rising labor and material costs is through the use of more automatic machinery. For instance, the Ex-Cell-O Piston Boring Machine shown to the left provides an excellent illustration of how automatic operation increases output per manhour. The pistons are fed into the machine from a chute, and after being rough and finish bored they are ejected onto a conveyor belt *at a rate of 200 pistons per hour net!* Pistons come to the machine with the wrist pin holes just as they are cast—no previous operations on them are necessary. The operator's only function is to load the work into the chute and spot check the finished parts. In many instances, one man can take care of several machines.

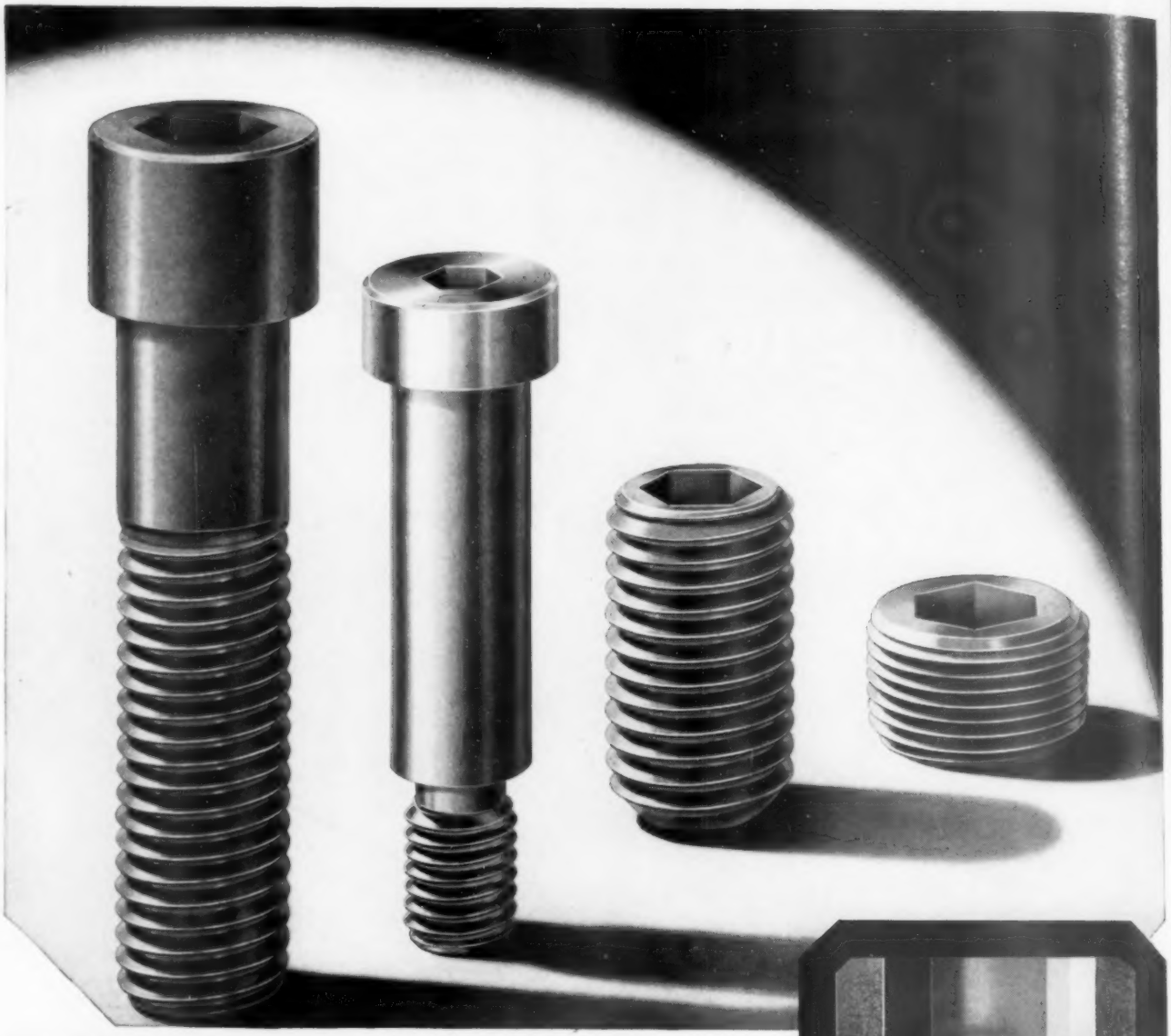
48-16

XLO

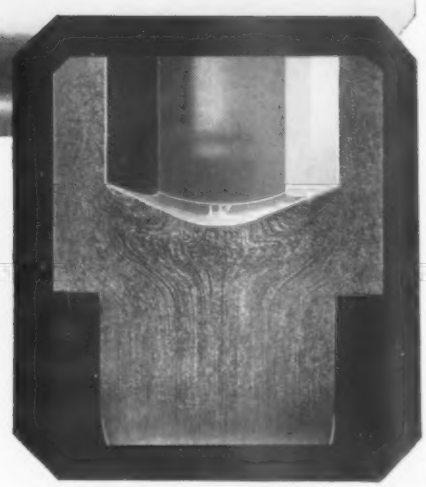
EX-CELL-O CORPORATION

DETROIT 6, MICHIGAN

Special Multiple Way-Type Precision Boring Machines • Special Multiple Precision Drilling Machines • Precision Boring, Turning, and Facing Machines, and Fixtures • Precision Cylinder Boring Machines • Precision Thread Grinding Machines • Precision Lapping Machines • Precision Broach Sharpening Machines • Other Special Purpose Machines • Tool Grinders • Continental Cutting Tools • Broaches, Broach Fixtures and Broach Grinders • Counterbore Sets • Grinding Spindles • Hydraulic Power Units • Textile Spindles • Drill Jig Bushings • R.R. Pins and Bushings • Fuel Injection Equipment • Dairy Equipment • Aircraft and Miscellaneous Production Parts



HOLO-KROME
fibro forged SOCKET SCREWS



Unretouched Photo Etched Cutaway
Holo-Krome Socket Head Cap Screw.

. . . . . *Alert to the necessity of*

DEPENDABLE PERFORMANCE

in Socket Screw fastening an ever increasing number of manufacturers are using Holo-Krome Completely Cold Forged Socket Screws because they can depend upon the Guaranteed Unfailing Performance of every single Holo-Krome Product . . . Specify "Holo-Krome."

THE HOLO-KROME SCREW CORPORATION, HARTFORD 10, CONNECTICUT

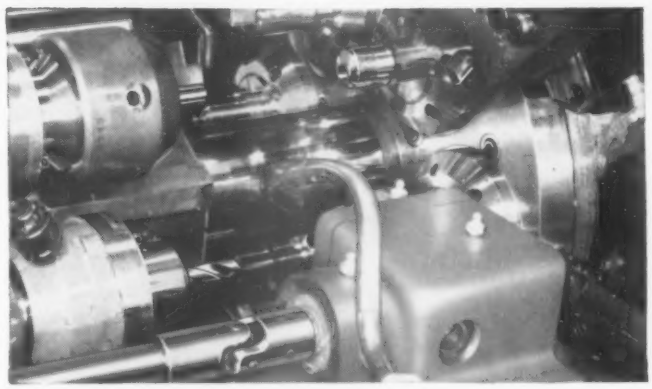
NEW BRITAIN AUTOMATICS LOWER BREAK-EVEN POINT ON THIS PIECE . . .

By

Eliminating 2nd operations
Reducing time and labor costs
Increasing production rate over 100%
Improving quality of product
Reducing material cost

A leading manufacturer formerly turned out the lock cylinder case illustrated from castings on five separate machines, each of which required a full time operator. Searching for more profitable production, he decided to investigate the possibility of automatic machinery.

By stopping the spindles and using eccentric drilling, plus milling attachments, New Britain engineers were able to put the entire job on one of our new model 601 Automatics using bar stock instead of costly castings. Production is maintained at 613 pieces per hour (5.8 secs. per piece), and the operator can easily take care of two other machines.



Eight operations plus cut-off are necessary to complete the piece. The spindle is stopped in the 4th position where the V slots are milled while the eccentric drilling attachment drills the main cylinder hole. Because specifications require the closest alignment between the two slots and the eccentric hole, the spindle is indexed to the 5th position without changing the alignment. In the 5th position the main cylinder hole is reamed while a cutter faces the end of the piece leaving a shoulder around the hole.

For a practical solution to mounting manufacturing costs . . . let New Britain engineers point the way to lowering the break-even point in your plant. Write today for your copy of "Cost Histories" which describes many specific approaches to more economical manufacturing.

Productivity, not price, is the measure of a machine.

NEW BRITAIN AUTOMATICS COST LESS PER FINISHED PIECE

THE NEW BRITAIN MACHINE CO.

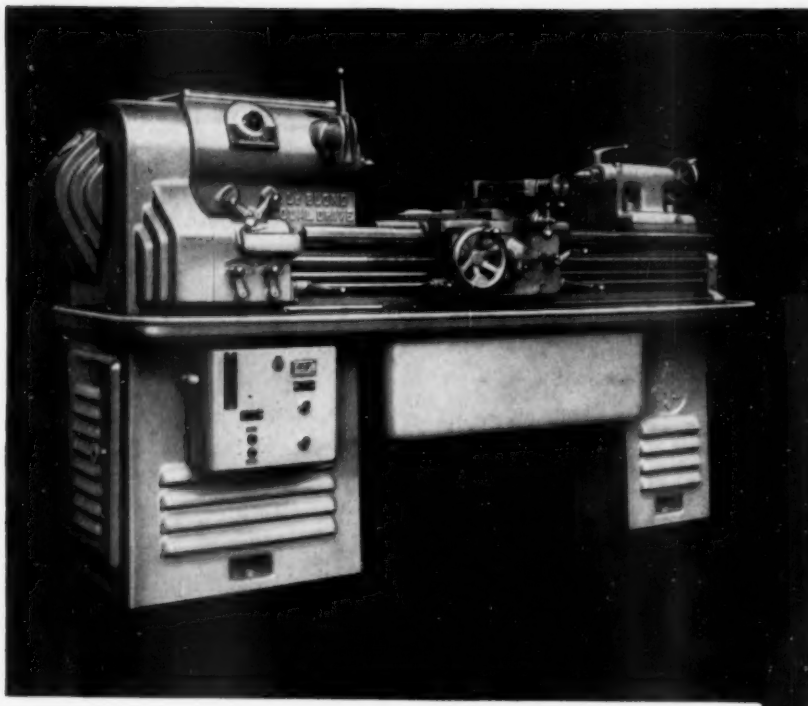
NB

NEW BRITAIN

Automatics

THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT

448HC1



DUAL DRIVE...

today's biggest lathe value
2 spindle speed ranges in one lathe

Yes, with the LeBlond Dual Drive you get the productive capacity of two ordinary lathes. For the ingenious Dual Drive head gives you a geared range plus a direct belt range.

12 spindle speeds 28 to 1800 rpm—4 carbide and 8 low and intermediate—are all controlled by a single lever.

And with the Dual Drive you get these additional plus values at no extra charge: totally enclosed, automatically lubricated quick change box . . . clutch and brake with 2-station control . . . one-piece apron with positive jaw feed clutch . . . multiple automatic length stops . . . 3-hp main drive motor . . . chip pan, and many others.

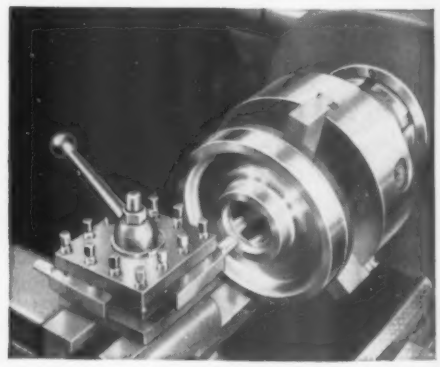
You can't buy a finer, more universal lathe. For complete information,

send for Bulletin No. 2 today.

THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO
LARGEST MANUFACTURER OF A COMPLETE LINE OF LATHES

FOR LOW SPEEDS and heavy stock removal

FOR CARBIDE SPEEDS and that mirror finish



AND FOR SPEEDS IN BETWEEN . . . Buy Dual Drive

LeBLOND